

# **Cardiovascular Disease in TEXAS**

## **A STATE PLAN WITH DISEASE INDICATORS AND STRATEGIES FOR ACTION**

**APLAN PREPARED BY:  
BUREAU OF DISEASE, INJURY AND TOBACCO PREVENTION  
TEXAS DEPARTMENT OF HEALTH**

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# ACKNOWLEDGMENT

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# TABLE OF CONTENTS

	PAGE		PAGE
<b>Introduction</b>	5	<b>Cardiovascular Diseases</b>	
<b>Strategies to address CVD</b>	6	Major Cardiovascular Disease	52
<b>Texas Coalition on CVD and Stroke</b>	8	<b>Ischemic Heart Disease</b>	
<b>Cardiovascular Disease and Stroke in Texas</b>	12	Sex and Race	53
<b>Background</b>	13	10 year Mortality Trend	54
<b>Risk Factors</b>		Geographic Location	55
1. Smoking	14	Public Health Regions	56
2. Cholesterol	14	<b>Stroke</b>	
3. HBP	15	Sex and Race	57
4. Diet	15	10 year Mortality Trend	58
5. Physical Activity	15	Geographic Location	59
6. Obesity	16	Public Health Regions	60
<b>Prevention Initiatives</b>		<b>Medical and Behavior Risk Factors with Prevalence</b>	
Primary Prevention	17	<b>Trends</b>	
Community	17	Obesity (Overweight)	62
Corporate	18	Current Smoking	63
Managed Care	18	High Blood Pressure	64
School Based	19	High Cholesterol	65
Church Based	19	Sedentary Lifestyle	66
Secondary Prevention	20	<b>Technical Notes</b>	67
<b>How Texas is Addressing CVD:</b>		<b>Texas Department of Health</b>	
<b>A Limited Inventory</b>		<b>Resources</b>	69
Public Sector	22		
Voluntary Sector	23		
Private Sector	25		
Education/Research	27		
Business	27		
Community	28		
<b>Conclusion</b>	29		
<b>Recommendations</b>	30		
<b>Demographics</b>			
Whites	36		
African Americans	37		
Hispanics	38		
<b>Socio-economic Indicators</b>			
Per capita income	40		
Food stamps participants	41		
Medicaid Eligibles - Families/Children	42		
Medicaid Eligibles - Aged/Disabled	43		
<b>Mortality</b>			
Leading Causes of Death	46		
Mortality Due to Chronic Diseases	47		
Chronic Diseases - Age at Death	48		
Overall Mortality Rates	49		
Trends in Leading Causes of Death	50		

# INTRODUCTION

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This report was prepared by the Texas Department of Health, Bureau of Disease, Injury and Tobacco Prevention to monitor outcomes for cardiovascular disease and stroke and associated medical and behavioral risk factors. It is a subset of a larger report on chronic disease conditions in Texas.

**Chronic disease conditions** are the major cause of illness, disability, and death in Texas as well as in the United States today. Despite broad public awareness of specific life-threatening diseases such as cancer and heart disease, most people are still not aware that, collectively, *chronic disease conditions account for three out of every four deaths in Texas and the United States.*

Chronic diseases are defined by the federal Centers for Disease Control and Prevention as those diseases that are prolonged, do not resolve spontaneously, and for which a complete cure is rarely achieved. The Texas Department of Health's Bureau of Disease and Injury Prevention monitors diseases that : a) fit this broad definition of chronic diseases; b) that are preventable; and c) pose a significant burden in mortality, morbidity, and cost. For this report, we chose to include the following chronic diseases: *ischemic heart disease, stroke, lung cancer, breast cancer, cervical cancer, colorectal cancer and diabetes mellitus.*

## **Demographics**

According to the U.S. Census estimates for 1996, Texas has the third largest African American population and the second largest Hispanic population among all states. Compared to the state's white population, a large proportion of the Texas African American and Hispanic populations have social, economic, or other factors that place them at increased risk for developing illness and experiencing premature death.

## **Leading Causes of Death**

Because of the changing nature of illness and death, Americans are no longer dying from the same diseases as they did in previous generations. Given the limits of medical and public health knowledge of this century, Americans frequently died at young ages from infectious and parasitic diseases. In 1900, pneumonia and influenza, tuberculosis and gastritis, enteritis and colitis were the three leading causes of death, accounting for nearly one-third of all deaths. As sanitation, nutrition, and living conditions improved and medical technology advanced, deaths from infectious diseases declined steadily and children and young adults survived longer. While deaths from infectious diseases have decreased, deaths from chronic conditions have increased. Today, heart disease, cancer, and stroke are the three leading causes of death, accounting for almost two-thirds of all deaths.

## **Preventable Causes of Death**

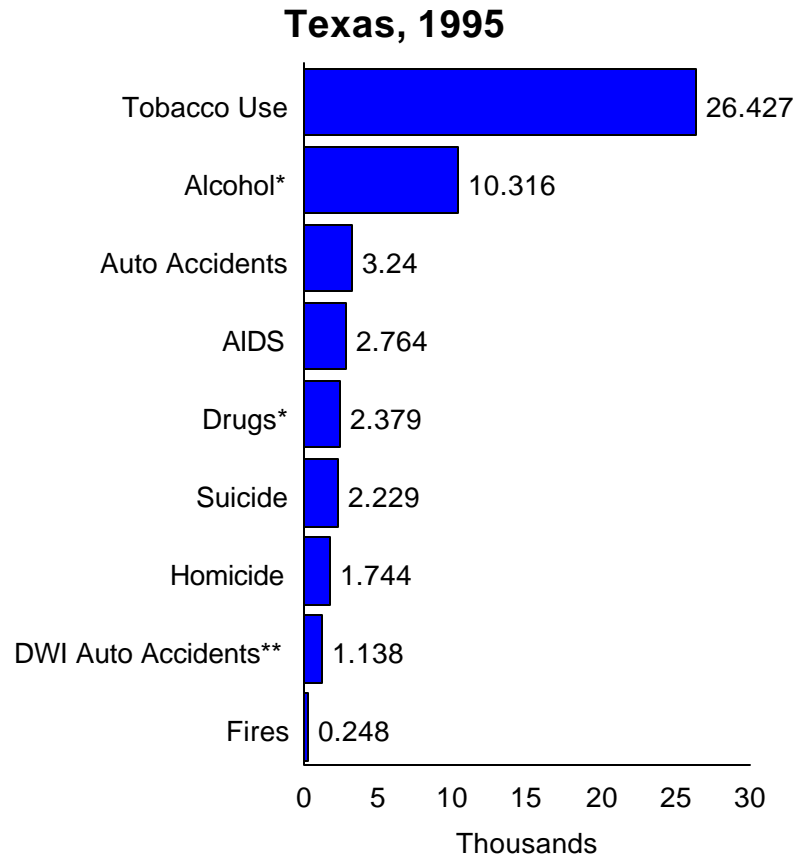
The figure in the opposite page shows that tobacco use is the most preventable cause of premature death in Texas, accounting for more than 26,000 lost lives in 1995 ----- more than alcohol, auto accidents, AIDS, drugs, suicides, homicides and fires **combined**. Tobacco use contributes substantially to deaths from cancer (especially cancers of the lung, esophagus, oral cavity, pancreas, kidney and bladder), cardiovascular disease (ischemic heart disease, stroke and high blood pressure) and lung disease (chronic obstructive pulmonary disease).

The content of this report provides information on cardiovascular diseases and stroke, its risk factors and trends over time. Data from this report contribute to the planning and implementation of strategies that will improve the health of all Texans.

# PREVENTABLE CAUSES OF DEATH

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## Texas Preventable Deaths



Source: Vital Statistics, TDH; \* Texas Commission for Alcohol and Drug Abuse;  
\*\* Mother's Against Drunk Driving, 1995

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## STRATEGIES TO ADDRESS CARDIOVASCULAR DISEASES IN TEXAS

- ***Epidemiology/Surveillance***
- ***Health Education/Community Outreach***
- ***Improve Provision of Clinical Preventive Services***
- ***Community/Worksite Environmental Changes***
- ***Addressing the Root Causes of Risky Behaviors***



Texas Coalition  
On  
Cardiovascular Disease  
And  
Stroke



# Texas Coalition on Cardiovascular Disease and Stroke

## History

In 1996, cardiovascular disease (CVD) was responsible for more than 40% of all deaths in Texas, or two out of every five deaths. More people die from CVD and stroke than all forms of cancer, accidents, and AIDS combined. CVD and stroke cost Texas over \$9 billion per year. The average cost of a coronary artery bypass totals \$44,200 per patient, and the average cost of ranges from \$15,000 - \$35,000. Medicare charges alone from CVD procedures in Texas were over \$500 million in 1994. CVD is the number one cause of emergency room visits, and often the first appearance of heart disease is sudden death or a major coronary event.

## Birth of a Coalition

On April 8, 1998, the *Texas Coalition on Cardiovascular Disease and Stroke* was created to explore ways of reducing the morbidity, mortality, and economic cost from cardiovascular disease and stroke. This collaborative effort draws on the strengths of a diverse membership to coordinate and promote effective statewide and local initiatives and to garner support from health care, business, managed care, and the Texas Legislature for prevention initiatives. George Rodgers, MD, former chair of Texas Medical Association's Committee on Cardiovascular Disease, and Clyde Yancy, MD, President of the American Heart Association, Texas Affiliate, co-chair the coalition.

The coalition currently comprises over 50 organizations throughout the state representing providers, managed care, business, government, research, medical schools, pharmaceutical companies, and volunteer organizations.

## The Legislative Effort

In the Texas Legislature, House Speaker James E. "Pete" Laney issued a charge to the House Public Health Committee to "study the effects of cardiovascular disease in Texas and assess the potential to reduce the health, social, and economic impacts through affirmative programs and prevention, care, and treatment." Representative Diane White Delisi (R, Temple), who chaired the subcommittee that was appointed to address this charge, recently presented their findings to the full committee on October 1. The report concludes that while prevention efforts can effectively reduce the incidence of CVD and stroke; resources for research, education, prevention and treatment are insufficient and uncoordinated. Recommendations include the establishment of a forum on CVD which would, among other things, coordinate and promote successful prevention initiatives at the statewide and local levels and establish a database to enhance data collection and analysis related to CVD and Stroke. Additionally, the report recommends educating the Texas Education Agency and local school districts about the long-term benefits of a public school curriculum that includes physical education, nutrition and health education.

## **Summary**

The health and economic burden of cardiovascular disease and stroke is tremendous. As the number one and number three causes of death for all Texans, CVD and stroke are also the biggest drain on our health care resources. Risk factors such as tobacco use, high cholesterol, high blood pressure, obesity, and physical inactivity can be controlled through lifestyle modification and appropriate use of medications.

The Texas Coalition on Cardiovascular Disease and Stroke supports the reduction of the health and economic burden of CVD and stroke in Texas through public awareness, improved coordination of prevention initiatives, enhanced data collection and improved treatment. The Coalition advocates for the creation of a state-sponsored entity to address CVD and stroke.



# Cardiovascular Disease And Stroke In Texas

**Cardiovascular disease (CVD)** refers to a group of diseases that target the heart and blood vessels and is the result of complex interactions between multiple inherited traits and environmental issues including diet, body weight, blood pressure, and lifestyle habits. Common forms include heart disease, stroke, and congestive heart failure.

A major cause of CVD is atherosclerosis, a general term for the thickening and hardening of the arteries. It is characterized by deposits of fatty substances, cholesterol, and cellular debris in the inner lining of an artery. The resulting buildup is called a plaque. These plaques can partially or completely occlude a vessel and may lead to heart attack or stroke. Three of the major causes of atherosclerosis are 1) elevated levels of cholesterol and triglycerides, 2) high blood pressure, and 3) cigarette smoke.

Heart disease and stroke are not only the number one and number three killers in the nation (respectively), but together they are the number one drain on health care resources. According to the American Heart Association, 58,200,000 Americans are estimated to have one or more types of cardiovascular disease; these diseases claim more lives than the next 7 leading causes of death combined. Additionally, about 4.9 million Americans live with the debilitating effects of congestive heart failure, which is the single most frequent cause of hospitalization of Americans age 65 and older. The American Heart Association has estimated that CVD will cost Americans \$274 billion in medical expenses and lost productivity in 1998. (1)

In Texas, heart disease claimed 42,330 lives (30.3% of all deaths) in 1996, up from 41,630 the previous year, and continues to be the leading cause of death (Appendix A). Stroke ranked third with 9,845 deaths (7.0%), compared to 9,788 in 1995. Together, these two diseases rank 1 and 3 respectively as killers both nationally and in Texas (2). It is estimated that they cost the state more than \$9 billion dollars a year which totals over \$500 per Texan (3).

One quarter of the Texas population is enrolled in Medicaid and/or Medicare (4.6 million in Texas). In 1995, there were approximately 185,000 Medicare hospitalizations in Texas for which CVD was listed as a principal cause for admission. Medicare paid over \$1 billion dollars for these stays. Medicare charges from CVD procedures alone in Texas were over \$500 million (4).

Known as the silent killer, the first appearance of heart disease is all too often sudden and devastating. At least 250,000 Americans die each year from heart attacks within 1 hour of experiencing symptoms and before reaching a hospital. CVD is the number one cause of emergency room visits, and more money is spent on treating heart disease and stroke than any other cause of hospitalization. The average cost of coronary artery bypass totals \$44,200 per patient not including rehabilitation and lost productivity (1). Approximately 10 to 20% of bypass surgeries are repeat surgeries, and after 10 years, up to 50% of bypass grafts will become occluded (5). The average cost of stroke is \$15,000 per patient not including rehabilitation and lost productivity. Of note, 10% of strokes exceed \$35,000 (6).

In Texas, as well as nationally, mortality from CVD has been steadily declining over the past 17 years. Evidence from heart attack registers tells us that much of the fall in mortality is attributable to changes in risk factors, rather than advances in medical care (7). Nonetheless, CVD continues to be the major cause of death, particularly among Texas' minority populations. The highest mortality is found among the black population, both in Texas and in the U.S. Mortality for blacks from heart disease is almost 150% that for whites and almost twice that for Hispanics. Additionally, the mortality rate for stroke among blacks is about twice that for both whites and Hispanics (1).

## RISK FACTORS DRIVING HEART DISEASE AND STROKE

There are several factors that increase the risk of heart disease and stroke. The major *non-modifiable risk factors* are heredity, male sex, and increasing age. The *modifiable risk factors* are smoking, high cholesterol, high blood pressure, physical inactivity, and obesity. Other risk factors that contribute to one's risk of developing CVD include *diabetes* and stress.

**Smoking:** *Tobacco uses is the single largest cause of preventable death and disease in Texas.* Smokers generally have a twofold increased risk of heart disease, regardless of whether filtered or non-filtered cigarettes are used. Equally important, smoking is the *most reversible risk factor* for heart disease and stroke. Studies have shown that two to five years after people quit smoking, regardless of how long or how much they have smoked, their **risk of heart attack drops to that of non-smokers**. Smoking cessation is particularly important because it not only reduces risk of CVD, but also helps prevent cancer and chronic lung disease.

The **Texas Behavioral Risk Factor Surveillance System (BRFSS)** has been collecting risk factor prevalence data since 1987. Based on survey responses, almost 3 in every 10 adult Texans classified themselves as smokers. Overall smoking prevalence in Texas has remained unchanged since, 1987, with a **prevalence of 23.7%** (Appendix B). By age group, the 35-44 year old age group had the highest percentage of smokers (30%). The 18-24 y.o. group showed a smoking prevalence increase of 7.9%. Further breakdown reveals that the 18-24 y.o. males made the greatest contribution to increasing rates. Smoking prevalence for whites was 24.5%, 27.2% for blacks, and 19.6% for Hispanics (8).

The average age of first cigarette use is 12 years. The average age for chewing tobacco is 10 years. In fact, the American Journal of Public Health reported that in Texas, the **estimated number of smokers 12-18 y.o. is 202,871**. This statistic ranks Texas second, only behind California.

**Cholesterol:** High blood cholesterol is a major modifiable risk factor for heart disease. The cholesterol level in the blood is determined partly by inheritance and partly by acquired factors such as diet, calorie balance, and level of physical activity. Increased blood cholesterol, specifically high LDL-cholesterol, increases risk for heart disease. Epidemiologic data show that a reduction of at least 10% in total cholesterol yields a greater than 20% reduction in coronary heart disease risk in the medium term, and 30% in the long term. (9)

Conversely, high levels of **HDL-cholesterol** protect against heart disease, irrespective of total cholesterol. Available evidence show that *for every 1mg/dl decrease in HDL-cholesterol the risk for heart disease increases by 2-3%*. (10)

BRFSS survey data from 1995 reported **24% of Texans** as having high cholesterol. While the rates varied by race (whites at 26.9% versus Hispanics at 12.7%), the rates were fairly consistent by gender.

The National Cholesterol Education Program (NCEP) recommends the following levels:

- Total cholesterol <200mg/dl
- HDL cholesterol >35mg/dl
- LDL-cholesterol <130mg/dl

The NCEP suggests **dietary modifications** such as reducing intake of saturated fat as the first intervention for treating undesirable, cholesterol levels. When dietary modifications are not sufficient in reaching cholesterol goals, medications as advised by a physician are indicated. While **cholesterol-lowering medications** can effectively lower total and LDL-cholesterol, few are able to raise levels of HDL-cholesterol. **Physical exercise** is one effective way of raising levels of protective HDL-cholesterol. Physical exercise is one effective way of raising levels of protective HDL-cholesterol (10).

**High Blood Pressure:** Often cited as the silent killer because of its lack of symptoms, high blood pressure is a significant risk factor for heart disease and stroke. People with uncontrolled high blood pressure have **four times the risk of developing heart disease** and as much as **seven times the risk of developing stroke** compare to those with normal blood pressure. The Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure (1993) has established **<130/85 as ideal** (11).

**Nearly 24%** of those surveyed in the BRFSS reported having high blood pressure. Blacks demonstrated the largest prevalence at 38.5%, while whites and Hispanics were lower, 25% and 17.2% respectively. Also, age is a significant predictor of hypertension prevalence with the higher age groups showing higher prevalence.

Most cases of high blood pressure can be prevented or treated with simple lifestyle modifications such as **sodium restriction, exercise, and weight loss**. For those with significantly high blood pressure (>160 systolic and/or >100 diastolic), or who do not respond to diet and exercise intervention, Blood pressure medications when advised by a physician are very effective at controlling high blood pressure.

**Diet:** Dietary factors and sedentary lifestyle account for at least **300,000 deaths** in the United States each year. Diet plays a significant role in diabetes, cancer, cardiovascular disease, and its risk factors. *Eating a healthy, low fat diet with a maximum of 30% of total calories from fat could reduce heart disease rates by 5-20%.* Nutrients found in fruits and vegetables can counteract the atherogenic effects of free radicals in the body, but most Americans do not eat enough fruits or vegetables for this protective benefit.

When fat intake is analyzed, age, sex, and education were all independently related to a person's reported fat intake. Younger respondents reported higher fat intake than older respondents did. Women in all age groups eat a healthier diet of less fat and more fruits and vegetables than men. African Americans tend to eat fewer servings of fruit and vegetables than whites or Hispanics.

**Physical Inactivity:** The benefits of regular physical activity are well-established, and emerging studies continue to support an important role for habitual exercise in maintaining overall health. ***Physical activity decreases the incidence of CVD, lowers total cholesterol and increases HDL-cholesterol, lowers high blood pressure, reduces risk of developing type II (adult onset) diabetes, and increases longevity*** (12). Quantitative estimates indicate that sedentary living is responsible for about one third of deaths due to heart disease, colon cancer, and diabetes - three diseases for which physical inactivity is an established risk factor (13).

Fortunately, it is becoming increasingly clear that physical activity does not need to be highly structured or regimented to yield health benefits. Furthermore, the threshold of intensity necessary for the health benefits of exercise is lower than previously thought. The American College of Sports Medicine and the Centers for Disease Control suggest that all American should accumulate **at least 30 minutes of moderate-intensity physical activity on most, preferably all, days of the week** (14).

Despite this overwhelming data, **only 22%** of adult Americans are currently active enough to derive health benefits; 53% are somewhat active while 25% are completely sedentary. In fact, recent trends over the past several years indicate that rates of sedentary lifestyles may be *increasing* **(15)**.

According to 1994 BRFSS data, sedentary lifestyle was more prevalent among Texans with less education or lower household income. Further, those without healthcare coverage were more likely to be sedentary than their insured counterparts (71% versus 53% respectively).

**Obesity:** The American Heart Association has recently promoted obesity to the rank of a major risk factor for heart disease. Some of the negative health consequences of obesity include **glucose intolerance and diabetes, high blood pressure, decreased levels of HDL-cholesterol, increased LDL-cholesterol levels, and increased mortality from all causes.**

About **54% of Americans** are overweight according to recently revised standards, and more than 22% are medically obese. Nearly 30% of Texans surveyed in the 1995 BRFSS survey reported being overweight. When the prevalence is examined by race, nearly 50% of African-Americans reported being overweight compared to just over 26% of whites **(16)**.

The reason for the shamefully high rates of obesity in America is simple: we eat far more than we need and we exercise far less than we should. We have too much food available, restaurants compete by offering bigger servings, and technology has made it increasingly possible to avoid physical activity. The food news is that *even a modest weight loss of 5-10% of body weight (just 20 pounds in a 200-lb person) can significantly decrease the risk of heart disease* **(16)**.

***Of note, with all of the risk factors, higher educated respondents usually led healthier lifestyles.***

Recommendations from the American Heart Association for comprehensive risk factor reduction is presented in Appendix C **(17)**. AHA has also developed specific actions for patients, providers, and health care organizations to increase compliance with prevention and treatment recommendation; these are also presented in Appendix C **(18)**.



## Prevention Initiatives

### Primary Prevention

Primary prevention is defined as the modification of risk factors and prevention of CVD in **persons with no known disease**, i.e. targeting risk factors *before* they cause disease. The best approach is the one that is able to positively influence the behavior of its target population. Therefore, no single approach can be described as best because the ability of an approach to reach its target population depends on factors such as disease prevalence, cultural influences, and community resources. Further, no single approach by itself can elicit permanent changes in behavior in any given population. Following are examples of successful primary prevention initiatives.

### *Community Approaches*

#### Stanford Three Community Study

A 2-year mass media cardiovascular health education campaign was implemented in two communities from January 1973 through the summer of 1975. In the last year of the campaign (1975), the media effort was reduced by one-half. The campaign was bilingual and delivered through various media: TV, radio, newspapers, and billboards. Pamphlets and cookbooks were mailed to the participants. Some participants received small-group instruction.

Although plasma cholesterol increased in all towns, the increase was greater in the control group. **Both men and women in the treatment towns reported reductions in dietary cholesterol (23 to 34%) and saturated fat (25-30%).** Although this project was effective in stimulating behavior change, these changes were temporary. Pairing the mass-media campaigns with face-to-face intervention was more effective in creating long-term behavioral changes (19).

#### Stanford Five-City Project

Researchers at the Center for Research in Disease Prevention at Stanford University School of Medicine implemented a 14-year trial of comprehensive, community-based CVD risk reduction education with the goal of producing favorable changes in knowledge, prevalence of CVD risk factors, and heart disease and stroke rates. Two cities received continual multi-media exposure punctuated by four to five separate risk factor education campaigns each year. Spanish language programming was also utilized. In addition, special programming targeting grades 4,5, 7, and 10 was implemented.

Knowledge of CVD risk factors was significantly greater at follow-up in the communities exposed to the educational campaign. Participants achieved a significant net decrease in cholesterol level (about 2%) and blood pressure (about 4%). Declines in tobacco use in treatment cities always exceeded those in control cities by about 13%. ***Treatment cities had significantly greater decreases in estimated all-cause mortality (about 15%) and significant falls in heart disease risk (about 16%).*** The organizational and educational programs were administered at a per capita cost of \$4 per year. This cost represents 4% of the estimated annual per capita expense on cigarettes (20).

### North Karelia, Finland

Launched in 1972 in response to a local petition to reduce the burden of heart disease in North Karelia, this study explored whether it was possible to influence risk factor levels in the population and if so, whether such changes lead to changes in heart disease rates. The comprehensive educational program was based on local community action and local service structure (21).

***From 1972 to 1987, the percentage of residents with no risk factors increased from 12.2% to 28.9%. Further, the percentage of people who had any one risk factor increased from 31% to 41.8%. The number of high-risk men and women decreased from 56.9% to 29.2% and 36.6% to 13.5%, respectively (22).***

### West of Scotland Coronary Prevention Study (WOSCOPS)

This study evaluated over 6500 men of average age 60 years with high cholesterol and no history of heart attack or heart surgery. Patients received either pravastatin, a similar cholesterol-lowering drug, or placebo for 5 years. Mortality and morbidity from heart disease was reduced by 31%, and total mortality by 22% in the pravastatin group (23).

### ***Corporate Approaches***

The Stay Alive and Well program at Reynolds Electrical & Engineering Company (Las Vegas) cost \$76.24 per employee during its first two years of operation. Over half of the 1,600 employees participated. ***Participants significantly lowered cholesterol levels, blood pressure, and weight and experienced 21% lower lifestyle-related claim costs than non-participants.*** Resulting savings were \$127.89 per participant with a benefit to cost ratio of 1.68 to 1 (24).

With medical costs per employee at \$6,000, nearly twice the national average, Union Pacific Railroad implemented a personal health management@ for its 28,000 employees, mostly union and blue collar, in 19 western and southern states. ***The program achieved a net savings of \$1.26 million.*** In addition, employees who participated lowered their risk of high blood pressure by 45% and high cholesterol by 34%. Others moved out of the at-risk range for weight problems (30%), and 21% stopped smoking (25).

Providence General Hospital saved an estimated \$1.5 million, or a cost-benefit ratio of 1 to 4.24

over the three years of an outcomes-based employee health benefits program in which financial incentives were offered to employees who demonstrated responsibility for their health and fitness based on set criteria. The program showed reductions in the use of health benefits, lower medical claims, less absenteeism, and improved health habits. ***Health care claims were 33.6% lower for employees at Providence General than at nine other similar hospitals (26).***

## ***Managed Care Approaches***

A disease management program run through **PPO operator CCN** (Community Care Network) saved an estimated \$158,600 in health care costs for three Chicago employers. The program, which was limited to high-risk patients, included worksite-based smoking cessation classes and reimbursement incentives for weight loss and exercise programs. Additionally, CCN coordinated with its network hospitals to provide worksite screening, hospital-based cardiac rehabilitation, and exercise classes at community recreation centers. Hospital staff also provided monthly follow-up calls to help participants set goals and monitor their progress.

**Of the 73 participants who were tracked, only 27 were still high-risk after one year.** The number of patients who exercised climbed from 2 to 53, and 10 to the 30 smokers quit. Almost half of those with high blood pressure were able to lower their blood pressure to moderate or low risk, and the number of overweight patients dropped from 610 to 49, with all patients losing an average of 11 pounds each.

Health plan members, employers, and network physicians joined efforts with CIGNA HMO to promote cardiovascular health at the worksite and in the physician's office. Following a worksite health screening and lifestyle survey, Results were compared to Healthy People 2000 goals. Four groups were approved for interventions focusing on fitness, weight management, and nutrition. The lifestyle survey will be repeated in 1998 to see if any improvement has occurred **(27)**.

## ***School-based Approaches***

The National Heart Lung and Blood Institute's Child and Adolescent Trial for Cardiovascular Health (CATCH) curriculum covers nutrition, physical education and smoking for 3<sup>rd</sup> and 5<sup>th</sup> graders with related family activity packets and comprehensive training materials for school food service and physical education and is available for less than \$300. It was proven effective in reducing risk factors and improving awareness in individual children and schools. Other programs with useful components include the AHA's HeartPower schoolsite program, USDA's Team Nutrition, National School Lunch and Breakfast Matters, Fit for Life, Shape Up America!, and CRAVE to Be the Best **(28)**.

## ***Church-based Approaches***

Churches are an appropriate community setting for prevention initiatives. As an example, Grant/Riverside Methodist Hospital of Columbus, Ohio, implemented an eight-week heart risk assessment and educational program through local churches with a focus of overall risk factor awareness and modification. Included in each session was a 30-minute exercise session and health education. From June 1995 to June 1997, 653 individuals participated in the program, and outcomes included 46 newly diagnosed hypertensives, 102 abnormal lipid analyses, and 222 medical referrals. The church provides an excellent environment to assist and support individuals in establishing and maintaining healthy lifestyles **(29)**.

## **Secondary Prevention**

Secondary prevention is defined as the modification of risk factors and prevention of subsequent events in persons with established cardiovascular disease. These are patients who have already suffered a cardiac event such as heart attack or stroke or have been diagnosed through tests such as angiography. Following are examples of secondary prevention initiatives.

Dr. Dean Ornish's Lifestyle Heart Trial was the first study to offer strong scientific evidence that ***lifestyle changes alone can actually reverse the progression of atherosclerotic plaques in coronary arteries.*** The researchers reported that 82% of the 28 patients in their experimental group - who followed a strict program of a low-fat vegetarian diet, smoking cessation, stress management training, moderate aerobic exercise, and group support - showed plaque regression. This program showed that high cholesterol can be reduced with intensive lifestyle changes and that these changes can begin to reverse even severe coronary heart disease after only one year, without the use of cholesterol-lowering drugs (30).

The Scandinavian Simvastatin Survival Study (4S) examined 4444 men and women with high cholesterol and a history of heart disease who were maintaining a cholesterol-lowering diet. Patients received either simvastatin (a cholesterol-lowering drug) or placebo for 5.4 years. Mortality from further heart attacks in the simvastatin group was reduced by 42%, occurrence on non-fatal heart attacks by 34% heart surgery by 37% and total mortality by 30%. Further, the simvastatin group had a 28% reduction in stroke and transient ischemic attacks (31).

The Stanford Coronary Risk Intervention Program (SCRIP) demonstrated a 50% slowing in rate of progression of heart disease with combination of lifestyle changes (diet, exercise weight loss, smoking cessation, counseling) plus appropriate use of medications. For this study, 259 men plus 41 women were randomly assigned to the SCRIP program, and 155 to Ausual care@ at another medical school. At the conclusion of four years, SCRIP participants showed a 40% reduction in cholesterol consumption, 23 reduction in LDL-cholesterol, 20% increase in exercise, and 12% increase in HDL-cholesterol (32).

Merck Pharmaceuticals has implemented a program called Heart Smart to address cholesterol- lowering therapy as secondary prevention. Included in the program are treatment protocols, chart audit forms, and patient education materials. In addition, through Pittsburgh Health Research Institute, Heart Smart tracks cardiovascular risk management.

Cardiac Rehabilitation comprises supervised prescriptive exercise training and risk factor modification in patients with established heart disease. The goals of cardiac rehabilitation are to improve functional capacity, alleviate or lessen activity-related symptoms, reduce disability, and identify and modify risk factors in an attempt to reduce subsequent morbidity and mortality due to cardiovascular illness. Out-patient programs are currently provided by approximately 2,350 US hospitals and another 700 independent clinics (33).

Favorable outcomes of cardiac rehabilitation, measured by controlled clinical trials, include ***reduction in the frequency and duration of subsequent rehospitalizations, reduction in total and cardiac-related mortality, reduction of symptoms, improvement in risk factor profile, and improvement in quality of life***. The known economic benefits of cardiac rehabilitation are derived primarily from reduced secondary utilization of inpatient medical resources. Unfortunately, of the several million patients with heart disease in the US who are candidates for cardiac rehabilitation, only 11-38% participate in cardiac rehabilitation programs (34).

Baylor Health Care System's LEAP (Lifestyle Education Awareness Program) for Life program was created to increase the number of cardiovascular patients who receive risk factor education and guidance in secondary prevention. This program was created in response to the fact that while risk factor education is necessary, nationally only 10-11% of cardiovascular patients participate in cardiac rehabilitation services. The program's multidisciplinary team includes physicians, nurses, exercise specialists, dietitians, pharmacists, social workers, and chaplains. Participants receive eight hours of interactive education on how to manage CVD. Topics include understanding heart disease and medications, stress management, healthy eating, and exercise. Participants are tracked at three, six, and twelve months post-attendance to measure hospital readmissions, effectiveness of education, and compliance (35).

Results from the first full year of outcomes show that 15% of angioplasty patients had a cardiac re-admission compared to national statistics which show that approximately 20% of angioplasty patients undergo repeat angioplasty and 5% require bypass surgery within one year of original intervention. In addition, 89% of participants contacted one year following workshop participation knew their individual risk factors for heart disease.

Secondary prevention effects a greater impact on morbidity and mortality in a shorter period of time compared with primary prevention. However, both approaches are necessary to address cardiovascular disease. In fact, prospective studies have shown that secondary prevention is almost always cost-effective, as is primary prevention.

## How Texas is Addressing CVD: A Limited Inventory of Texas Resources

### *Public Sector*

#### **Texas Department of Health**

The Texas Department of Health's Bureau of Chronic Disease Prevention and Control collects, interprets and disseminates data relating to behavioral risk factors, cancer, and other chronic conditions. In addition, it also provides health information and education related to tobacco use prevention, nutrition, physical activity, diabetes, and other chronic disease risk factors. And it provides technical assistance and consultation to support development of environmental and policy changes related to tobacco use, physical activity, and nutrition within worksites, restaurants, schools, communities and health care organizations. It is both state and federally funded. FY 98: \$17,875,180.28

#### ***Strategies:***

- 1) Epidemiology/surveillance
- 2) Health education/community outreach
- 3) Improve provision of clinical preventive services
- 4) Community/worksite environmental changes

#### **Adult Health Program**

Promotes and supports the practice of prevention in clinical settings and encourages environmental changes for healthier behaviors in communities. The program provides consultation and technical assistance for implementing a comprehensive clinical prevention system which emphasizes case management of the individual patient. Within this program are several components:

- Alzheimer disease Program (FY 98: \$101,206)
- Osteoporosis Awareness and Education Program (FY 98: \$195,324)
- Prostate Cancer Education Program (FY 98: \$20,028)

#### **Clinical Preventive Services Program**

Supports the incorporation of preventive services into clinical settings throughout the state by promoting the use of the federal **Put Prevention into Practice** (PPIP) model. PPIP helps clinical staff conduct the system changes necessary to make risk assessment and counseling a routine part of the services provided. Currently, PPIP has funded 26 sites, directly worked with 120 clinical sites, and has provided materials to 1100 sites. The clinical specialist is usually a nurse, and there is one staff person per region (11 regions). *It is completely federally funded.* FY 98: \$658,958

#### **Chronic Disease Community and Worksite Wellness Program**

Promotes increased physical activity and proper nutrition choices to prevent heart disease and cancer using population-based approaches for healthier lifestyle choices. The program provides technical assistance and consultation to support development of environmental and policy changes. Staff consists of 3-4 employees per health region (11 regions). *Federal and state funding.* FY 98: \$2,507,139.28

### Behavioral Risk Factor Surveillance System (BRFSS)

Ongoing random digit dial telephone survey of adult Texans to assess the prevalence of lifestyle risk factors that contribute to the leading causes of premature death and disability. In 1997, 3000 interviews were conducted with an estimated 5000 to be conducted in 1998. The program produces *Texas Risk Factor Report* newsletter and an annual surveillance poster. *Funded through CDC*. FY 98: \$231,868

### Texas Diabetes Program/Council

Coordinates and implements programs aimed at preventing diabetic complications through patient and professional education and increased awareness. Current programs funded by the Council include the Texas Diabetes Institute in San Antonio, Information/Media Campaign, Walk Texas!, and CATCH. *State and federal funding*.

FY 98: \$3,731,145.77

### Office of Tobacco Prevention and Control (OTPC)

Established in 1986 with funding from the Texas Cancer Council to prevent and reduce tobacco use, particularly among youth. In partnership with the Texas cancer Council and the American cancer Society, a media campaign was developed. *State and federal funding*. FY 98: \$1,424,520.58

**Comments:** While TDH has no programs that specifically target cardiovascular disease, it has many programs that address particular risk factors. TDH feels that its endeavors are being utilized and are successful. It envisions developing a program based on facets of the others that strictly focuses on cardiovascular disease. In addition, it wants to augment its present programs to focus more on cardiovascular disease since it is a major public problem.

- ⇒ TDH has **no funding for public awareness campaigns**. Only anti-smoking programs have dedicated funding to public awareness campaigns. *Public awareness is the cornerstone of prevention.*
- ⇒ **Staff is very limited**. PPIP and Community program share a maximum of 4 people per region. There are only 11 regions, so there is considerable strain on existing manpower.
- ⇒ TDH feels that **increased funding** is needed for the Community and Worksite program. Although successful, this program cannot impact to the degree envisioned given the present budget.
- ⇒ Increased surveillance on risk factors for CVD and morbidity data is needed. Data from the Texas Health Care Information Council (THCIC) will help, but more specialized data and a mechanism to track its own programs is required.

## ***Voluntary Sector***

### American Heart Association

The American Heart Association has many programs to address heart disease and stroke. Multiple educational resources for each risk factor are available ranging from organized programming and take home brochures to cookbooks and videotapes. Four populations are targeted: African-American, Hispanics, women, and those 55 and older. Three resource booklets are available that cover all the programs, one for healthcare providers, another for the public at large, and one specifically for youth.

The American Heart Association has borne the cost of research and development, and continues to improve upon their materials as new information is discovered. The shelf life of some materials can be as little as two years. Several major programs are described below:

#### HeartPower

Age-specific school curriculum (grades Pre-K to 8) covering nutrition, physical activity, living tobacco-free, and the cardiovascular system. Also available in Spanish, the complete kit contains a teacher resource book, posters, activity cards, audiotapes, and 2 stethoscopes. (\$95-120)

#### Heart at Work

Cost-effective cardiovascular health promotion program for employees consisting of seven binders in a red cardboard cabinet. Each binder is sold separately and covers a different topic. (\$365 for entire kit, \$45 for each activity kit)

#### Search Your Heart

A church-base high blood pressure education program targeting African-Americans. Encourages church participation in awareness activities, blood pressure screening, and educational programs. (No charge for first kit, \$5.88 for subsequent kits)

#### Answers By Heart

53 brief, simple patient information sheets on cardiovascular disease conditions, treatments, tests and risk factors. (\$5 for 50 of each sheet)

#### Active Partnership for the Health of Your Heart

Cardiac rehabilitation program education package; includes videocassettes, audiocassettes, brochures and patient workbook. Specific materials for healthcare professional available as well. (\$95)

#### Stoke Connection

Packet for stroke families in need of information and support. Contains several pamphlets on stroke. (\$3)

#### Hispanics and Heart Disease: A Recipe for Change

Nutrition education program for the Hispanic community demonstrating healthy ways to prepare foods. (\$13)

#### ***Comments:***

- ⇒ The AHA has neither the staff nor the organizational framework to implement comprehensive program public awareness and subsequent surveillance for outcome studies. Thus, these programs rely on institutions such as schools and businesses to find their own program facilitators for continued operation. In Texas there are staff in only 20 cities, and 14 of those cities are staffed by only two people.
- ⇒ AHA lacks adequate funding to manage these programs, track the outcomes, and provide follow-up.



### **American Cancer Society**

Over the 21 year history of the **Great American Smokeout** in Texas, a rich tradition of success has been built that resulted in assisting 500,000 Texas smokers to stay quit because of the Smokeout. Nationally, for 20 years, 1000 million people did not smoke on Smokeout Day, and 10 million people stayed quit because of Smokeout.

Of the 238 Texas American Cancer Society units, more than 148 units participated in the Great American Smokeout/Great American SmokeScream. An estimated audience of over **1.7 million** was reached with educational program resources distributed to worksites, school districts, educational service centers, and individual school campuses. A total of 4,226 Texans signed the **Movie Industry Petition** which objects to the increase in smoking seen in film productions.

### ***Private Sector***

#### **Texas Medical Foundation**

The Texas Medical Foundation (TMF) is the Quality Improvement Organization (QIO) (formerly called Peer review Organization) for Medicare for the state of Texas. As an agent of the Health Care Financing Administration (HCFA), TMF is obligated to assess and assure the quality of care received by Medicare beneficiaries within the state. Since 1993, TMF has assessed and assured quality through the Health Care Quality Improvement Program (HCQIP). HCQIP is a population-based quality improvement program that focuses on improving the quality of care for diseases of high prevalence or burden of suffering, in which medical science indicates that there are interventions that will reduce morbidity and/or mortality, and in which unintentional variation exist in the application of these interventions. Since 1993, TMF has implemented approximately 60 quality improvement projects throughout the state.

In 1992, the diagnosis of acute myocardial infarction (AMI; i.e. heart attack) was the second leading cause of hospital admissions, affecting over 35.6 million Medicare beneficiaries in the United States. AMI accounted for over 15% of all Medicare expenditures for short-stay hospitalizations with an average cost of \$11,650. In Texas, there were 19,725 discharges with a principal diagnosis of AMI in 1996.

The Cooperative Cardiovascular Project (CCP), a nationally-based project coordinated by HCFA and implemented by QIOs in every state, was designed to increase the utilization of interventions that have been shown to reduce the morbidity and mortality of patients with AMI. In Texas, the CCP project received improvement plans from 181 acute care facilities affecting over 80% (15,859) of the total statewide AMI discharges. In idea patients (i.e. patients with no contraindication to treatment), appropriate administration of aspirin during hospitalization, and aspirin, beta blockers, and angiotensin converting enzyme (ACE) inhibitors at discharge increased as a result of the CCP project.

The percent improvement noted in Texas is similar to improvement noted in a four state pilot study that also evaluated the impact of the CCP project on mortality. In this study, there was a clinically relevant and statistically significant decrease in mortality rates.

In 1996, **congestive heart failure (CHF)** was the leading cause of Medicare hospital admissions in Texas, accounting for 35,129 acute-care admissions. In addition to being the leading reason for hospitalization, CHF has been reported as being the only major cardiovascular disorder that is increasing in incidence, prevalence, and mortality. TMF completed a Congestive Heart Failure pilot project with acute care facilities that focused on improving administration of ACE inhibitors in patients with CHF. This pilot study resulted in an improvement of the use of ACE inhibitors from 65.7% to 71.2%. Based on the success of this project, TMF has recently implemented a large scale CHF project with 99 acute care facilities. These facilities treat over 29% of patients discharged statewide with a principal diagnosis of CHF.

Routine right heart catheterization, as part of a bilateral procedure for coronary artery disease, is a procedure without scientific support of its benefit. TMF, in collaboration with 15 acute care facilities with the highest rates of bilateral catheterization in the state, and utilizing guidelines developed by the Committee on Cardiovascular Diseases of the Texas Medical Association, implemented a Right Heart Catheterization project. The project resulted in a statewide reduction in the rates of right heart catheterization from 32.7% in 1993 to 19.8% in 1997. In 1997, the cost savings, realized from the reduction of unnecessary right heart catheterization in the 15 participating facilities, was over \$450,000.

Patients with atrial fibrillation are nearly six times more likely to develop a stroke as compared to similar patients with normal heart rhythm. In 1997, there were 7,700 Medicare discharges with the principal diagnosis of atrial fibrillation. TMF developed an Atrial Fibrillation pilot project designed to improve the administration of warfarin at discharge for patients with atrial fibrillation. The pilot study resulted in a 22.7% increase in warfarin administration. Due to the success of the pilot project, TMF has recently implemented a large scale project that will impact over 25% of the statewide Medicare discharges for atrial fibrillation.

The prevalence of diabetes approaches 15% in the over-65 population. While this number is high, it significantly underestimates the prevalence of diabetes in Blacks and Hispanics. It is important to consider the impact of diabetes on a population when discussing CVD, since CVD is the leading cause of death within the diabetic population.

TMF has developed and implemented the Primary Care Diabetes project which is based on the Texas Diabetes Council minimum standards of care for diabetes under managed care in Texas. This project focuses on improving the utilization of interventions that have been shown to reduce morbidity and mortality (such as blood pressure checks, lipid level checks, eye exams, foot exams) in diabetic patients. TMF is working with 6 risk sharing HMOs that represent over 80% of the Medicare beneficiaries enrolled in managed care. While this project is ongoing, and final results of its impact will not be available for approximately 1 year, it is important to note that there is significant underutilization of these interventions.

#### Texas Medical Association

The Texas Medical Association has enjoyed a successful partnership with the American Heart Association, Texas Affiliate, for several years in development and coordination of the TMA Stroke Project (TMASP). During the first quarter of 1998, TMASP provided 403 CME hours to 221 physicians and five nurses in five locations across the state. Currently a three hour program, a fourth hour related to treatment of stroke as an emergency is being developed.

### Merck & Co., Inc.

Bringing the delivery of care for heart disease patients closer to national guidelines is the goal of **Heart Care Partnership**. Heart Care Partnership is designed to improve risk factor management in patients with heart disease through physician education, participation, and consensus development along with practice improvement processes and patient education. Development and implementation of Heart Care Partnership in Texas was a joint effort of Merck & Co., Inc.; the American Heart Association, Texas Affiliate; and the Texas Medical Association. The program helps hospitals improve quality of care and outcomes for patients with heart disease. Resources included in the program are educational workshops, quality improvement processes, and patient education materials. Heart care Partnership workshops address the treatment gap, define optimal care, and help hospitals develop individual plans for treating heart disease. The quality improvement process provide hospitals with baseline treatment data and tools to improve and measure outcomes over time.

### ***Education/Research***

#### **Cardiovascular Research Institute**

The cardiovascular Research Institute seeks to integrate research, training, and clinical practice focusing on the heart and blood vessels. The Institute represents a cooperative venture between Texas A&M Health Science Center College of Medicine, Scott & White Hospital, the VA hospital, and Driscoll Children's Hospital with participating sites in College Station, Temple, and Corpus Christi. The existing vascular research program has generated \$30 million in grant funds and is recognized both nationally and internationally as a leading center of blood vessel research. A heart research program and a consortium of over 50 cardiovascular physicians from participating clinical institutions work together to achieve a broad approach to cardiovascular functions and diseases.

#### **Goals:**

- 1) Foster research as the key to gaining an understanding of the mechanisms of human cardiovascular disease and to developing new therapies for these disorders.
- 2) Provide a forum for exchange of ideas and solutions to problems.
- 3) Increase the ability of basic and clinical researchers to access human tissues and patient populations.
- 4) Bridge the gap between research and clinical practice through translational research (i.e. lab bench to bedside).
- 5) Position TAMUSHSC and its clinical partners for a more aggressive approach to competing for expanding research funding.
- 6) Stabilize, strengthen, and expand subspecialty training programs in cardiovascular medicine and surgery.
- 7) Provide a strong academic environment for training of undergraduates, medical students, graduate students, postdoctoral fellows, and residents in the cardiovascular field.

## ***Business***

### **Health Plans**

The Texas Association of Health Plans represents sixty health plans. In a survey of their members, each one actively participates in cardiovascular disease management programs. While some focus their efforts on their members, many provide community outreach programs. One such example is NYLCare of Dallas. Each year, NYLCare is the corporate sponsor for Women's Health Walk to promote CVD awareness. In addition to providing publicity, NYLCare contributes about \$25,000 to this project annually.

### **Corporations**

Many businesses and corporations offer some form of health promotion programming for their employees. An example is the 3M Corporation which offers programs and resources that help 3M employees better balance work and family issues; contribute to overall job satisfaction, and enhance productivity and job performance. The following areas of well being are focused upon: mental, physical, social-emotional and spiritual. Programming is provided through seminars, on-site fitness activities and special events.

### ***Community Initiatives***

#### **The San Antonio Stroke Awareness Initiative Task Force**

A consortium of various community organizations and medical organizations has teamed up with the American Heart Association on a new aggressive pilot stroke program. San Antonio is one of five cities participating in the year-long pilot program with the single purpose of educating San Antonians about stroke. The Task Force comprises various community organizations and medical organizations.

Two overriding messages drive this initiative. The first message is "know the warning signs of stroke." The second message is "stroke is a medical emergency, call 911." Some of the activities of the Task Force include health fairs, community events, stroke screening, partnerships with local community service organizations, partnerships with community businesses and employee health programs, and professional education programs.

#### ***3 Subgroups***

Community Awareness Subgroup: Focus on the warning signs of stroke and recognition of stroke as a medical emergency.

Medical Professional Awareness Subgroup: Increase awareness and action to stroke within the medical community.

Public Relations Subgroup: General city-wide awareness campaign.

#### **The Dallas Area Coalition to Reduce Diabetes and Heart Disease**

Seeks a healthier community through collaborative efforts by making the entire community aware and involved in managing and reducing the incidence of diabetes and heart disease, resulting in a national reputation for healthy citizenry and workforce. So far, this coalition has created a database of community programs and resources for prevention and treatment of diabetes and heart disease. The database is divided into categories such as school, workplace, community, public awareness, health care sites, target population, and at-risk population so that trends and pockets where services are lacking can be easily identified.

**Goals:**

- 1) Lower rates of illness, deaths, cost.
- 2) improve education in adults and youth, leading to better lifestyle patterns.
- 3) Increase knowledge of signs and symptoms of diabetes and heart disease for the medically At risk@ populations.
- 4) Increase access to a continuum of education-prevention-intervention support systems.

**Action:**

- Target interventions in “high risk” populations.
- Develop an information system to help users access resources.
- Develop a communication system to link resource delivery system.
- Develop prevention program.

**Conclusion**

The health economic burden of cardiovascular disease and stroke is tremendous. As the number one and number three causes of death for all Texans, CVD and stroke are also the biggest drain on our health care resources with an annual estimated cost of over \$9 billion indirect health care costs alone. Together, CVD and stroke claimed the lives of over 52,000 Texans in 1996. Risk factors such as tobacco use, high cholesterol, high blood pressure, obesity, and physical inactivity can be controlled through lifestyle modification and appropriate use of medications.

While primary and secondary prevention can effectively reduce the rate of CVD and stroke, resources for research, education, prevention, and treatment are insufficient and uncoordinated. Coordination at the state-wide level is needed to ensure that all communities in Texas have access to effective primary and secondary prevention programs, such as the ones currently offered by various public, private, and voluntary organizations throughout the state. Currently, there is no targeted state funding to evaluate and address the burden of CVD in Texas. In addition, surveillance information to evaluate the effectiveness and health outcomes of different programs is lacking. Public and private sectors must work together in a partnership if Texas is to achieve meaningful reductions in CVD and stroke.

**Recommendations****Epidemiology/Surveillance**

- 1) A panel of the state’s leading experts in the prevention, treatment, research, and education of CVD and stroke should be appointed and charged with the responsibility of developing an effective and resource-efficient plan to reduce the morbidity, mortality, and economic burden of CVD and stroke in Texas. Panel members would include providers, researcher, representatives from public health, third party payers, large employers, and patients and families whose lives have been affected by CVD or stroke.
- 2) Enhance data collection and analysis related to CVD and stroke at the state and regional levels. Data is crucial for directing the activities of the panel in the most cost efficient manner. Data can be collected through existing avenues such as the Texas Department of Health, the Texas Health Care Information Council, hospital discharge data, insurance claims, and other potential sources such as the Texas Medical Foundation and pharmaceutical companies. This data would be kept in the public domain for all interested parties to access and use. Data is needed for the following purposes:

- to identify risk factor prevalence among youth and adults, with emphasis on special populations;
- to evaluate the morbidity, mortality, and economic cost of CVD and stroke;
- to identify existing gaps between scientific knowledge and treatment and identify opportunities to improve quality of care; and
- to examine community data related to environmental influences affecting risk factors for CVD and stroke such as school, worksite, and community policies and activities.

3) A mechanism should be provided to evaluate the implementation and effectiveness of the above recommendations and ensure accountability.

#### Health Education/Community Outreach

1) Enhance, coordinate, and promote health education, public awareness, and community outreach efforts through the Texas Department of Health and other public and private organizations.

#### Improve Provision of Clinical Preventive Services

1) Enhance systems of care by evaluating available clinical guidelines and developing uniform recommendations, *not mandates*, for prevention and acute and long-term treatment of patients with CVD or stroke. This cooperative process would involve health care professionals and managed care organizations from multiple entities in both the public and private sectors.

#### Community/Worksite Environmental Changes

- 1) Identify and create incentives, *not mandates*, for providers and employers to encourage efforts in prevention, public awareness, and treatment.
- 2) Emphasize to employers the importance of early identification and modification of risk factors and suggest methods by which they can assist their employees.
- 3) Educate Texas Education Agency and local school districts about the positive long-term benefits of a public school curriculum that includes physical education, nutrition, and health education and their relationship to CVD and stroke prevention.
- 4) Communities should be given assistance and incentives in developing comprehensive prevention efforts at the local level.

In addition to these strategies, increased coordination of activities should be implemented and these include:

- 1) Coordinate activities with groups that are addressing similar disease conditions and risk factors, such as the Texas Diabetes Council.
- 2) Evaluate the appropriate role and provide guidance for the following three areas of responsibility in prevention, public awareness, and treatment:

- Government
  - Health care system (providers, managed care organizations)
  - Patient and family
- 3) Improve access to appropriate prevention, public awareness, and treatment strategies for all Texans, including the uninsured and those living in rural or underserved areas.

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# DEMOGRAPHICS

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## Population Distribution by Race/Ethnicity

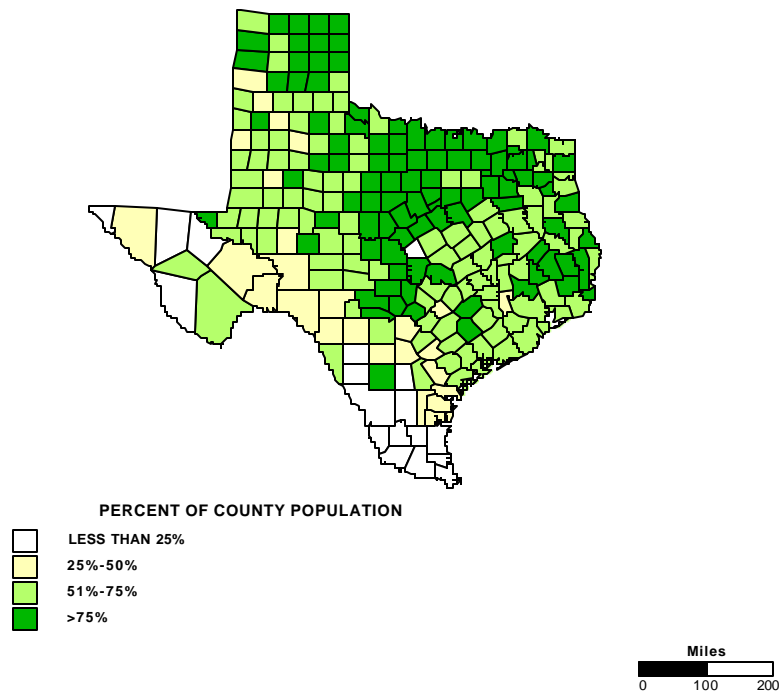
# DEMOGRAPHICS: RACE GROUPS - WHITES

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## Percent of Total County Population

### WHITES

1996 Population Estimates



- Shaded areas in the map show the proportion of county population that are White.
- There are a total of 99 counties that have more than 75 percent of its county population that are White. Most of these counties are concentrated in the north and central part of Texas.

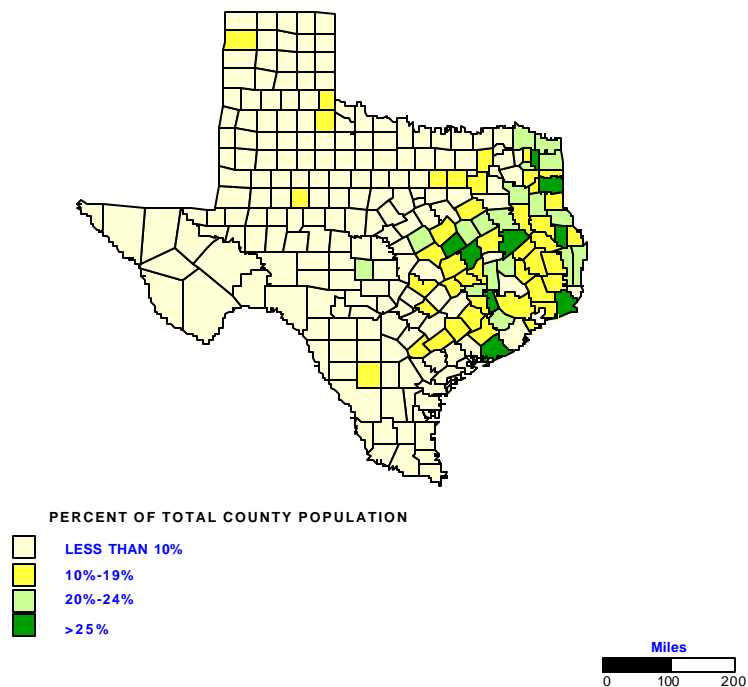
# DEMOGRAPHICS: RACE GROUPS - AFRICAN-AMERICANS

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## Percent of Total County Population

### AFRICAN AMERICANS

1996 Population Estimates



- Shaded areas in the map show the proportion of county population that are African Americans.
- There are a total of 9 counties that have more than 25 percent of its county population that are African Americans. Most of these counties are concentrated in the eastern part of Texas.

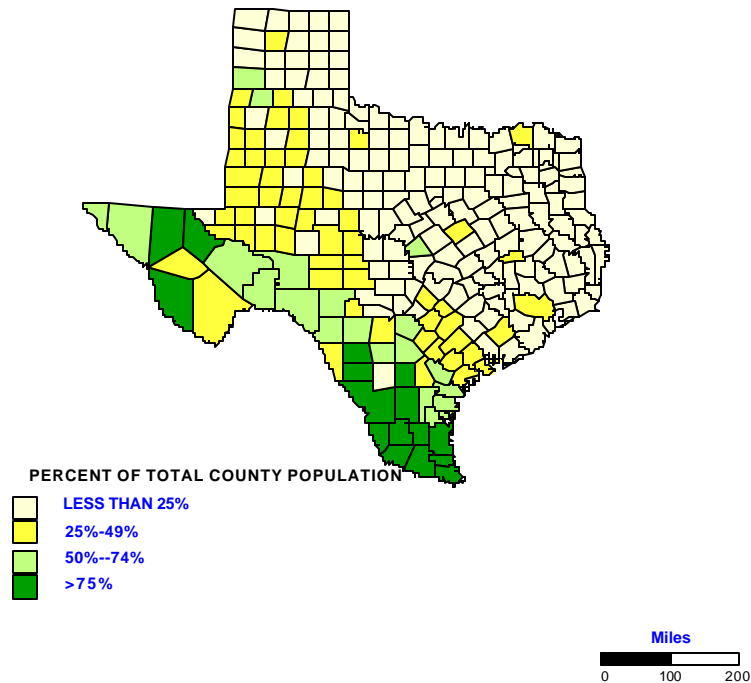
# DEMOGRAPHICS: RACE GROUPS - HISPANICS

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## Percent of Total County Population

### HISPANICS

1996 Population Estimates



- Shaded areas in the map show the proportion of county population that are Hispanics.
- There are a total of 16 counties that have more than 75 percent of its county population that are Hispanics. Most of these counties are concentrated in the south and western part of Texas.

# Socio-Economic INDICATORS

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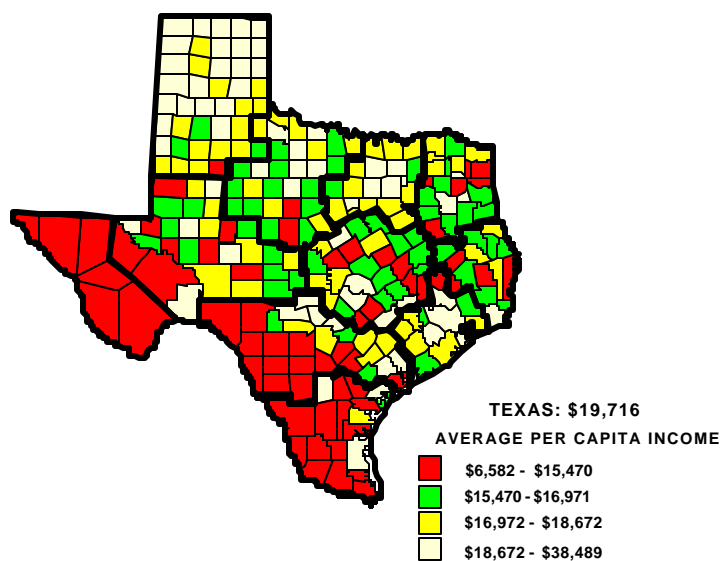
PER CAPITA INCOME  
MEDICAID ELIGIBLES  
FOOD STAMP PARTICIPANTS

# Socio-Economic Indicators: Per Capita Income

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## TEXAS AVERAGE PER CAPITA PERSONAL INCOME

ESTIMATES BY COUNTY, 1994



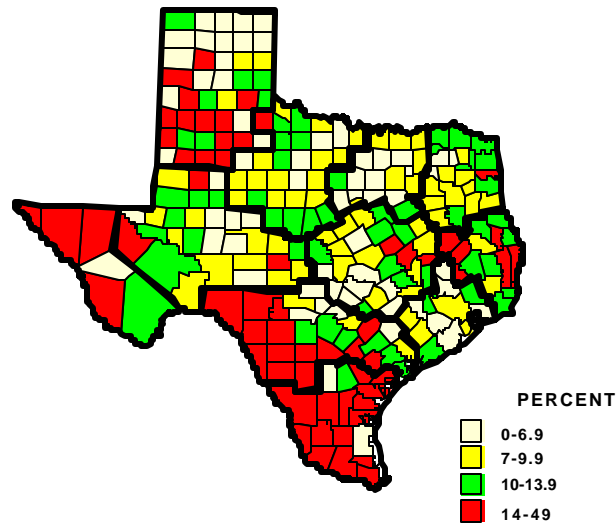
SOURCE: US Bureau of Economic Analysis  
Texas Comptroller of Public Accounts



# Socio-Economic Indicators: Food Stamps

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FOOD STAMP PARTICIPANTS  
PERCENT OF TOTAL COUNTY POPULATION  
FISCAL YEAR 1997



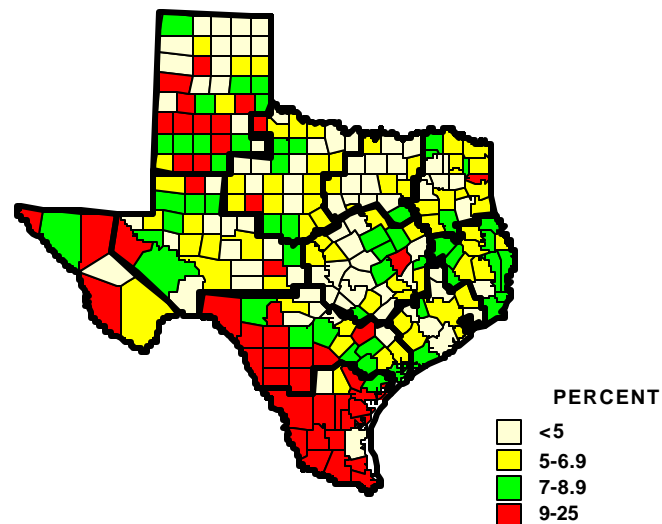
SOURCE: Texas Department of Human Services, 1997 Annual Report

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- Shaded areas in the map show the proportion of county population that are food stamp participants.
  - Counties with more than 15 percent of county population that are participating in the food stamp program are concentrated in the southern and western part of Texas.

# SOCIO-ECONOMIC INDICATORS: MEDICAID ELIGIBLE

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MEDICAID ELIGIBLE - FAMILIES AND CHILDREN  
PERCENT OF TOTAL COUNTY POPULATION  
FISCAL YEAR 1997



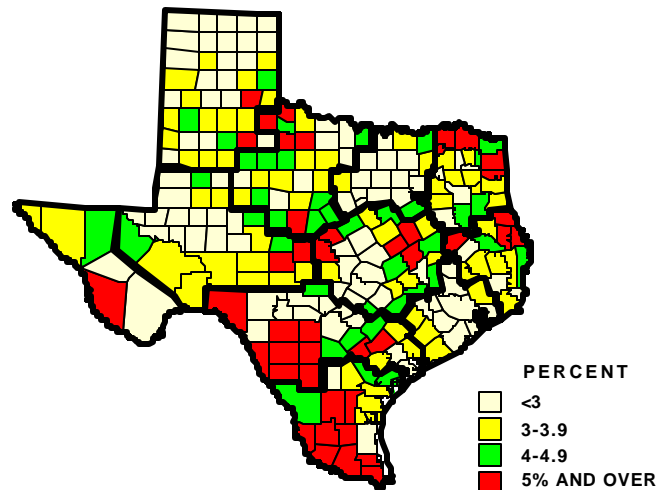
SOURCE: Texas Department of Human Services, 1997 Annual Report

- 
- Shaded areas in the map show the proportion of county population (families and children) that are medicaid eligible.
  - Counties with more than 9 percent of county population (families and children) that are medicaid eligible are concentrated in the southern part of Texas.

# Socio-Economic Indicators: Medicaid Eligible

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MEDICAID ELIGIBLE - AGED AND DISABLED  
PERCENT OF TOTAL COUNTY POPULATION  
FISCAL YEAR 1997



SOURCE: Texas Department of Human Services, 1997 Annual Report

- 
- Shaded areas in the map show the proportion of county population (aged and disabled) that are medicaid eligible.
  - Counties with more than 5 percent of county population (aged and disabled) that are medicaid eligible are concentrated in the southern part of Texas.



# MORTALITY

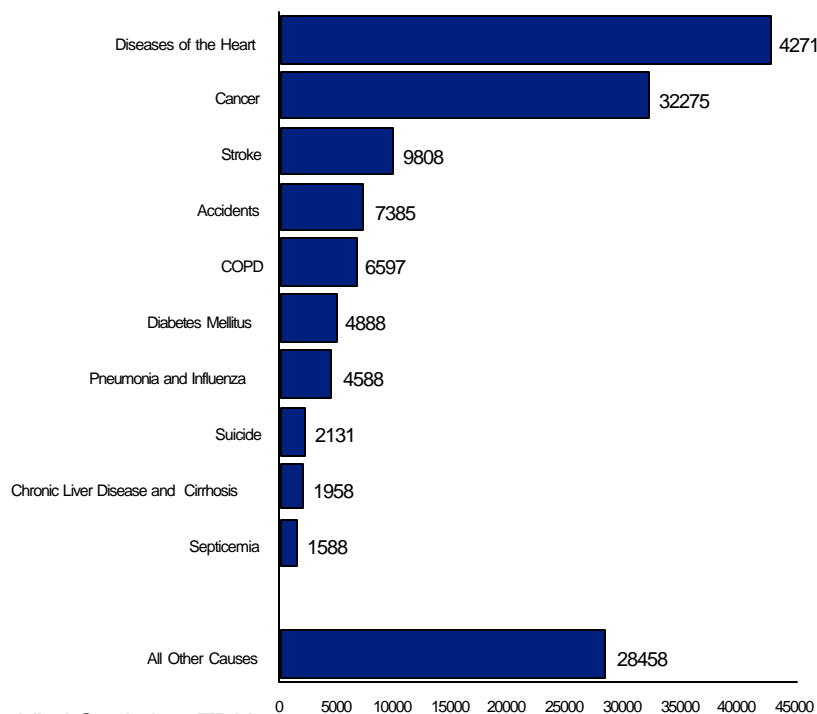
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# MORTALITY: MOST COMMON CAUSES OF DEATHS, 1998

## Leading Causes of Death

Texas, 1998



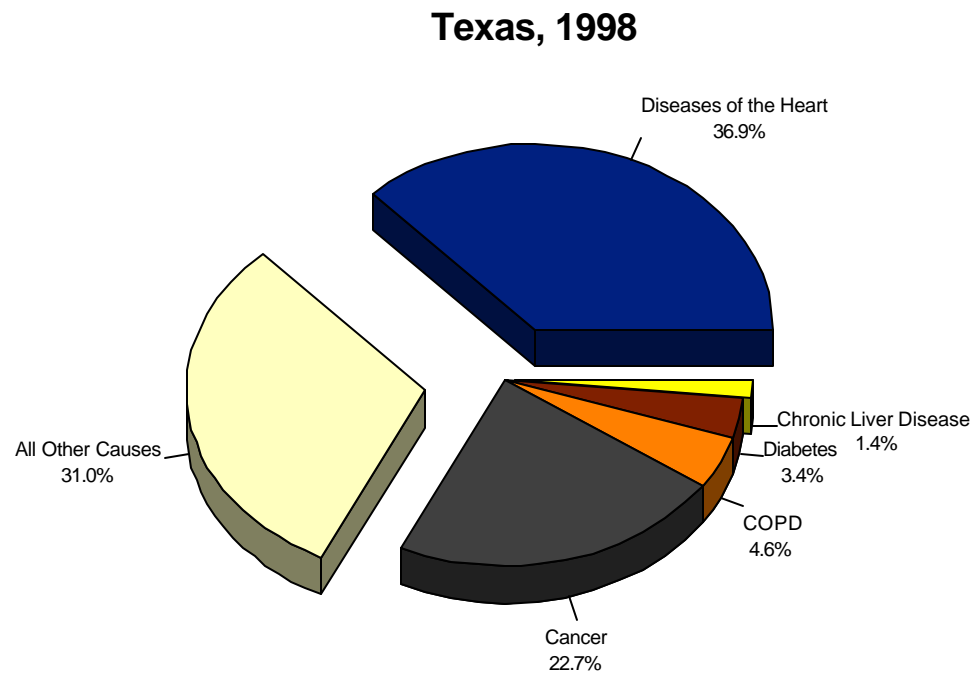
Source: Vital Statistics, TDH

■ The major cardiovascular diseases, including diseases of the heart and stroke, were the major leading causes of death in Texas in 1998. These group of diseases were responsible for more than 37 percent of all deaths among Texas residents during the same period.

# MORTALITY: BURDEN OF CHRONIC DISEASES, 1998

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## Mortality due to Chronic Diseases

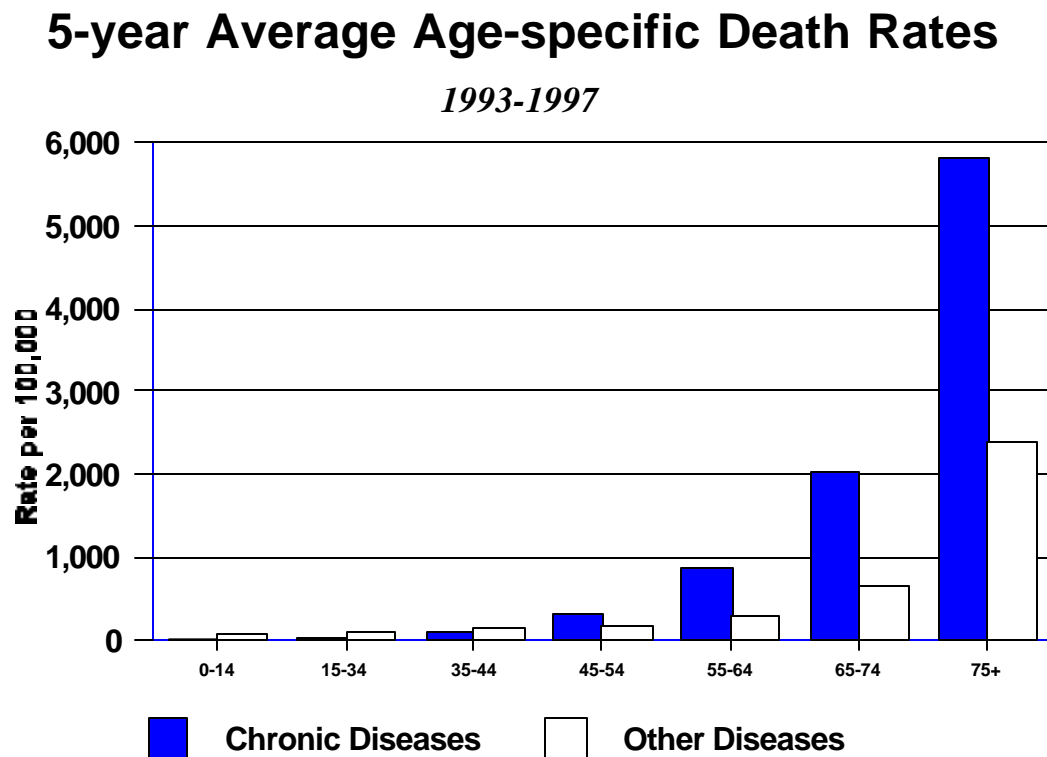


Source: Vital Statistics, TDH

- 
- About 69 percent of all deaths in Texas in 1998 were due to chronic diseases.

# MORTALITY: CHRONIC DISEASES - AGE AT DEATH

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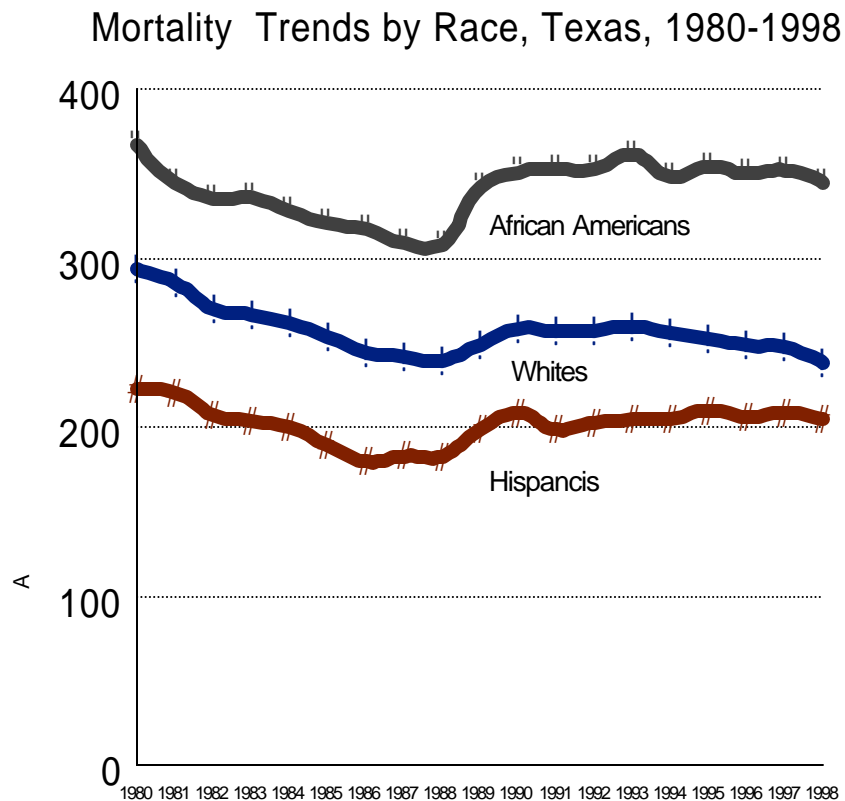
■ Mortality due to chronic diseases increases with age. Deaths due to chronic diseases become more common beginning at age 45.



# MORTALITY: OVERALL MORTALITY RATES

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## Selected Chronic Diseases



Source: Vital Statistics, TDH

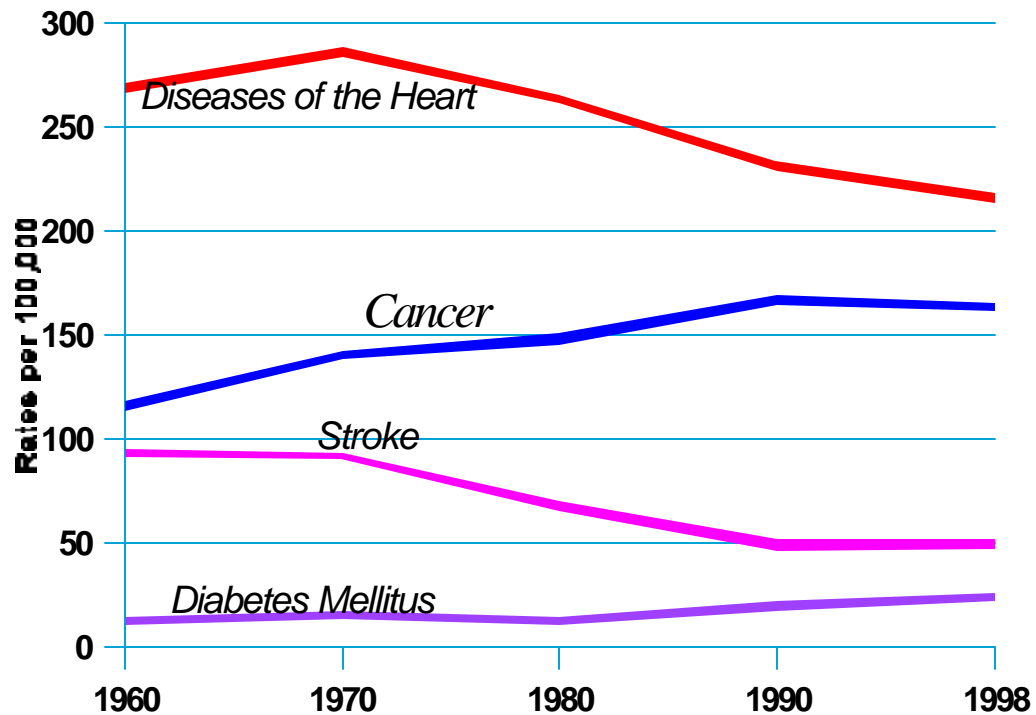
- African Americans experienced higher mortality rates for the selected chronic disease conditions during each year from 1980 through 1998 when compared to Whites and Hispanics.
- For all the race and ethnic groups, mortality rates appeared to have declined from 1980 through 1988. Due to disease reporting changes, mortality rates increased from 1988 through 1990. Rates have stabilized during the 1990s.

# MORTALITY: TRENDS IN LEADING CAUSES OF DEATHS

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## Trends in Selected Causes of Mortality

*Texas 1960-1998*



- 
- Mortality rates for diseases of the heart and stroke have shown a declining trend since 1960.
  - Mortality rates for cancer and diabetes mellitus have shown an increasing trend since 1960.

# **CARDIOVASCULAR DISEASES**

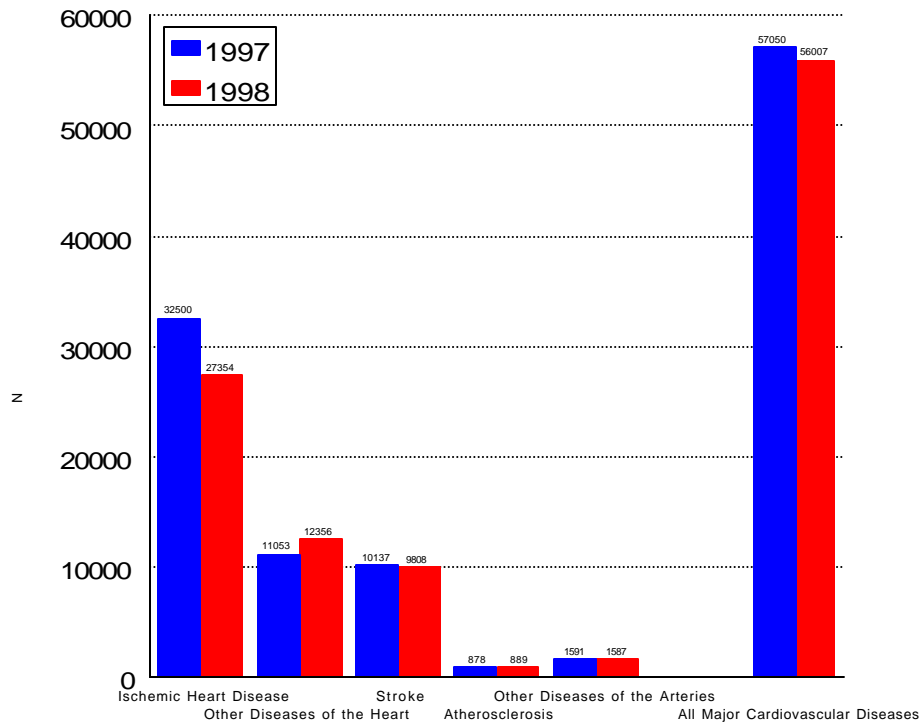
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# MORTALITY: CARDIOVASCULAR DISEASES

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## Major Cardiovascular Diseases

Texas, 1997 and 1998



Source: Vital Statistics, TDH

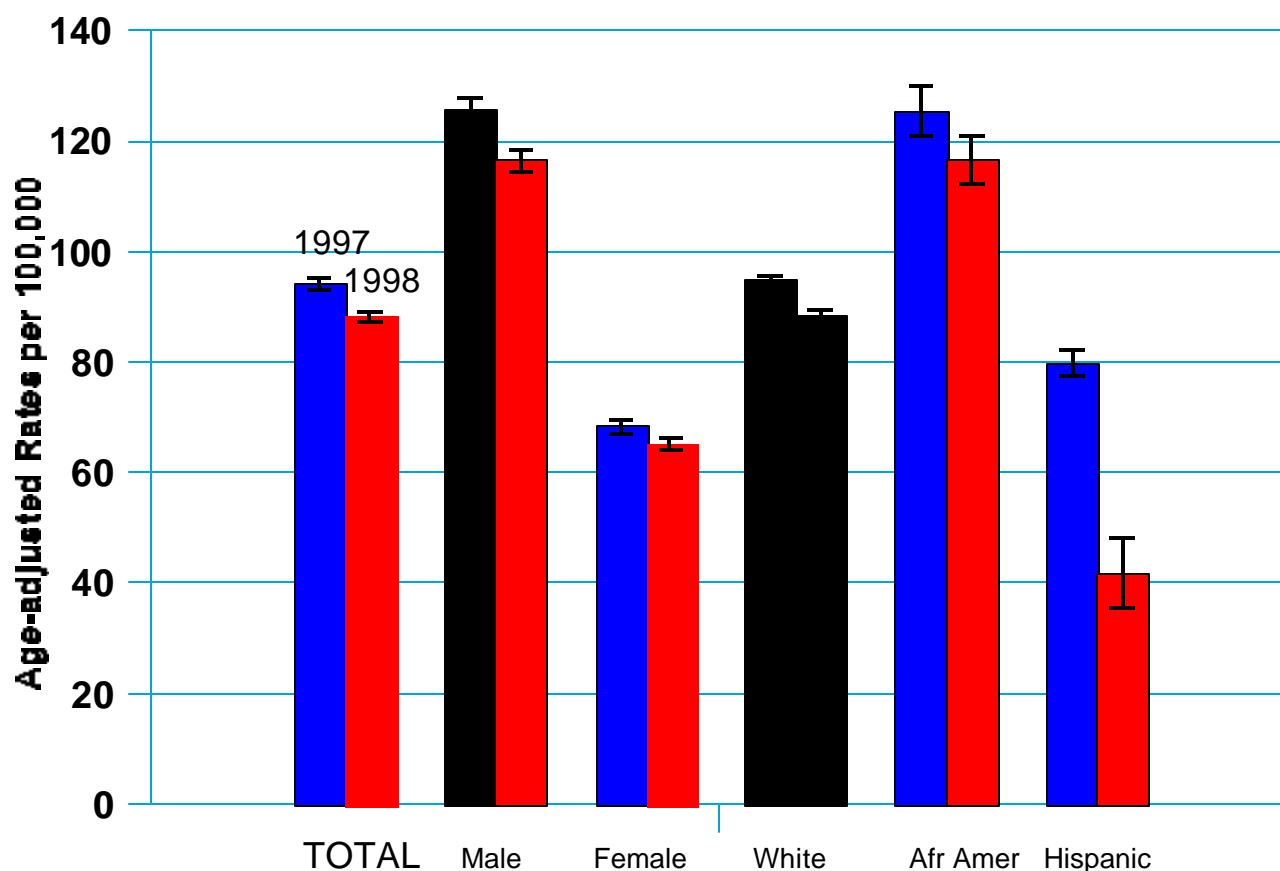
■ The major cardiovascular diseases were the most common cause of death in Texas, accounting for more than 37 percent of all deaths in 1998. Number of deaths decline slightly from 57,050 in 1997 to 56,007 in 1998.

■ Deaths due to ischemic heart disease declined from 32,500 deaths in 1997 to 27,354 deaths in 1998, a 16 percent decrease.

# MORTALITY: ISCHEMIC HEART DISEASE - SEX AND RACE

## Ischemic Heart Disease

*Sex and Race, Texas 1997 and 1998*



■ The overall mortality rate for ischemic heart disease for Texas significantly declined from 94.1 deaths per 100,000 in 1997 to 88.3 deaths per 100,000 in 1998.

■ While the mortality rate significantly declined among the males from 1997 to 1998, Texas males still have approximately twice the risk of dying from ischemic heart disease than females.

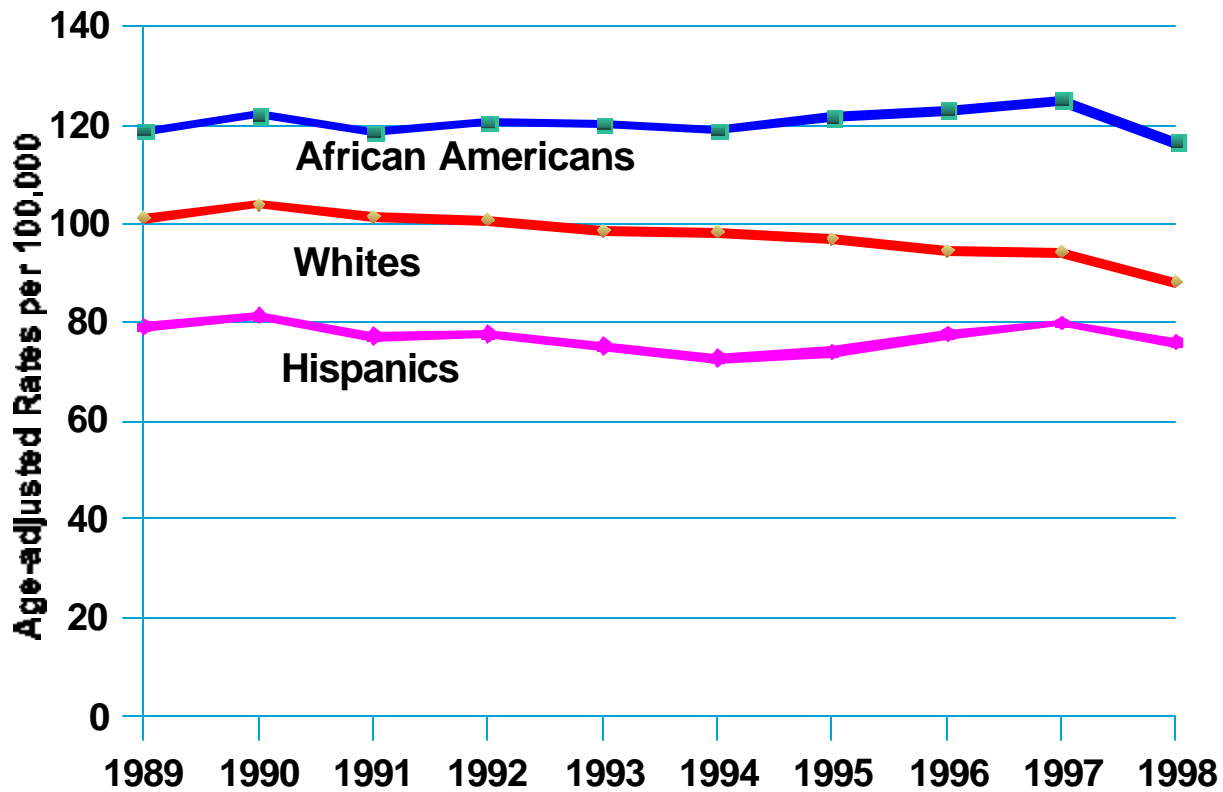
■ Among the race and ethnic groups, African Americans have the highest mortality rates compared to Whites and Hispanics. From 1997 to 1998, mortality rates for whites and Hispanics decreased significantly.

# MORTALITY: ISCHEMIC HEART DISEASE

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## Ischemic Heart Disease

*Ten-Year Mortality Trends by Race, Texas 1989-1998*

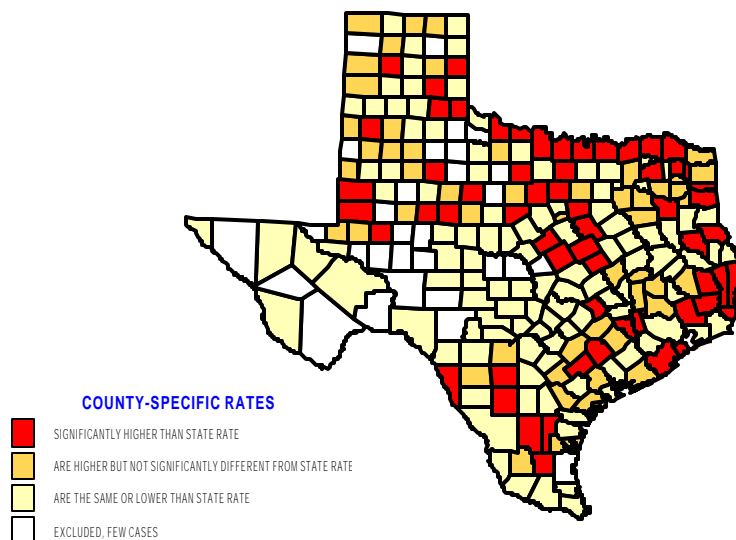


■ African Americans experienced higher mortality rates for ischemic heart disease for each year during the period 1989 through 1998 when compared to Whites and Hispanics.

# MORTALITY: ISCHEMIC HEART DISEASE

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## ISCHEMIC HEART DISEASE 5-YEAR AVERAGE AGE ADJUSTED MORTALITY RATES 1994-1998



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■ Shaded areas in the map represent geographic areas in Texas that have mortality rates that are higher or lower than the state's 5-year average age-adjusted mortality rate of 88.3 deaths per 100,000 persons.

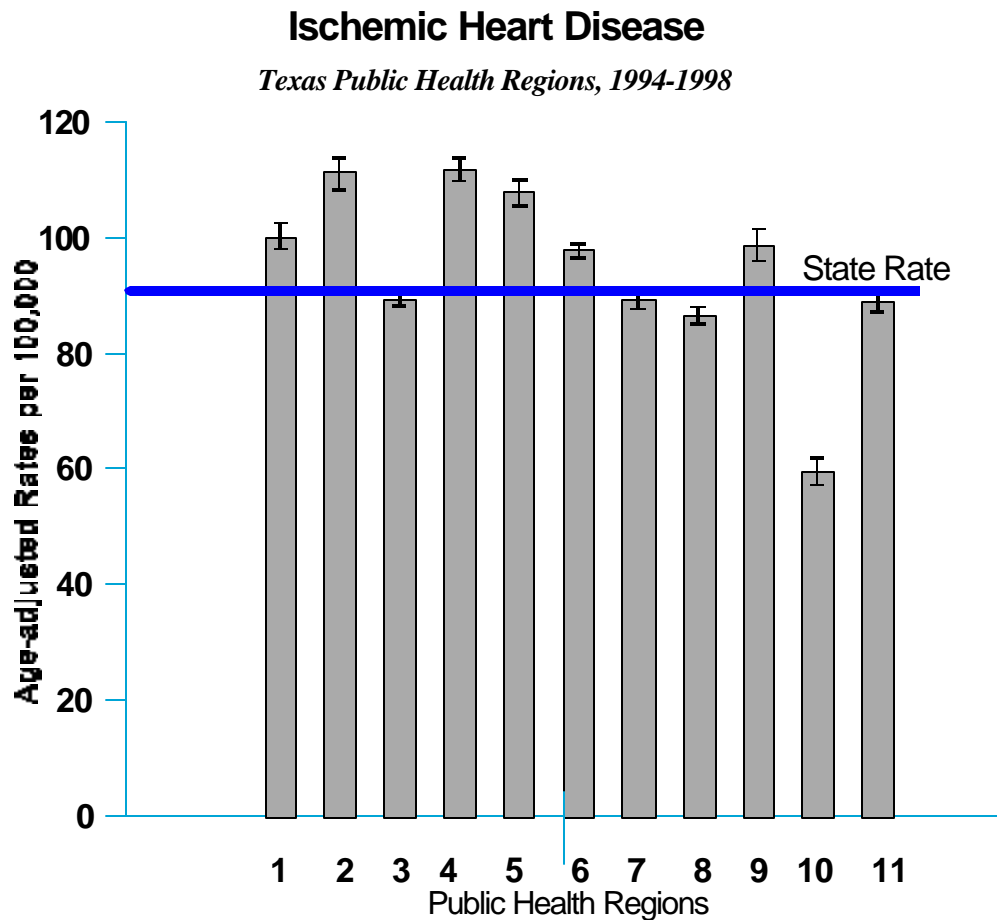
■ About 60 counties have mortality rates that are statistically significantly higher than the state's 5-year average rate. These counties are shaded red in the map.

■ A total of 51 Texas counties have higher mortality rates but were not statistically significantly different from the state's 5-year average. These counties are shaded yellow in the map.

■ About 113 Texas counties have similar or lower mortality rates than the state's 5-year average. These counties are shaded light yellow in the map.

# MORTALITY: ISCHEMIC HEART DISEASE

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■ The graph shows that the 5-year average age-adjusted mortality rates for ischemic heart disease for six Texas public health regions were higher than the overall 5-year average age-adjusted mortality rate for the state. These regions include PHR 1, 2, 4, 5, 6 and 9.

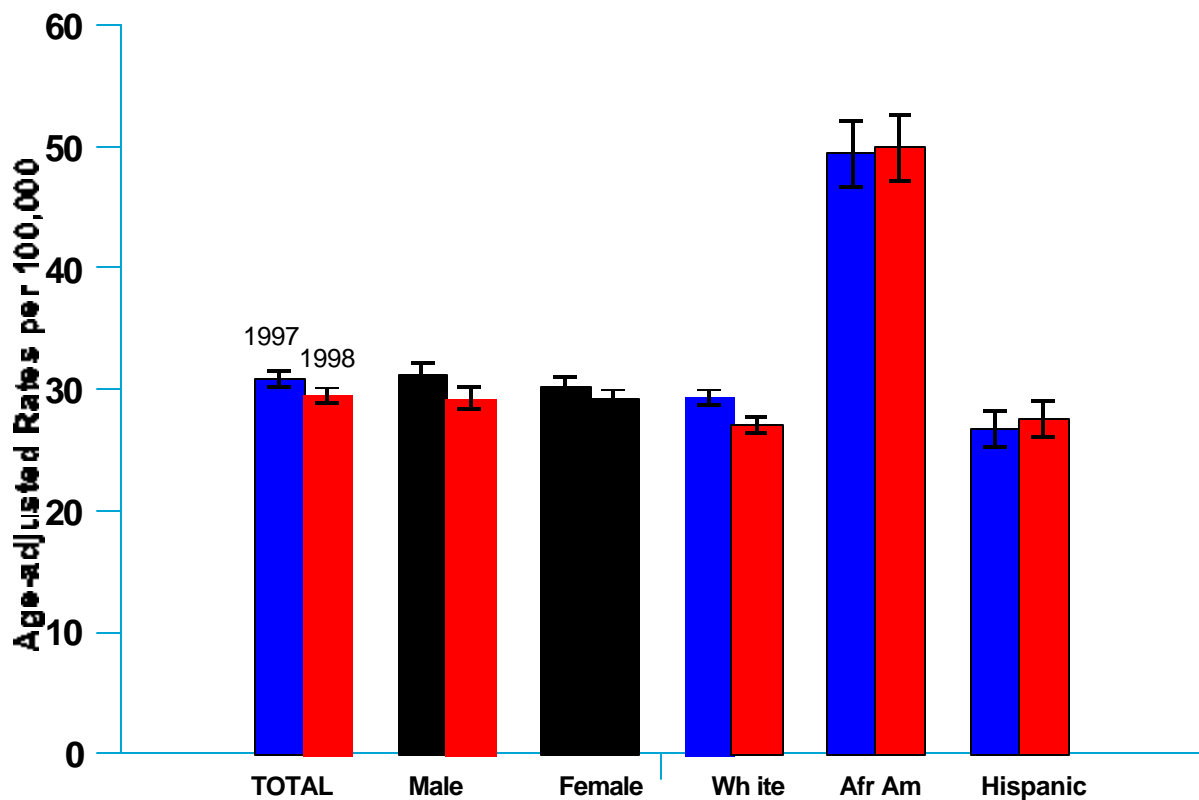


# MORTALITY: STROKE

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## Stroke

*Sex and Race, Texas 1997 and 1998*



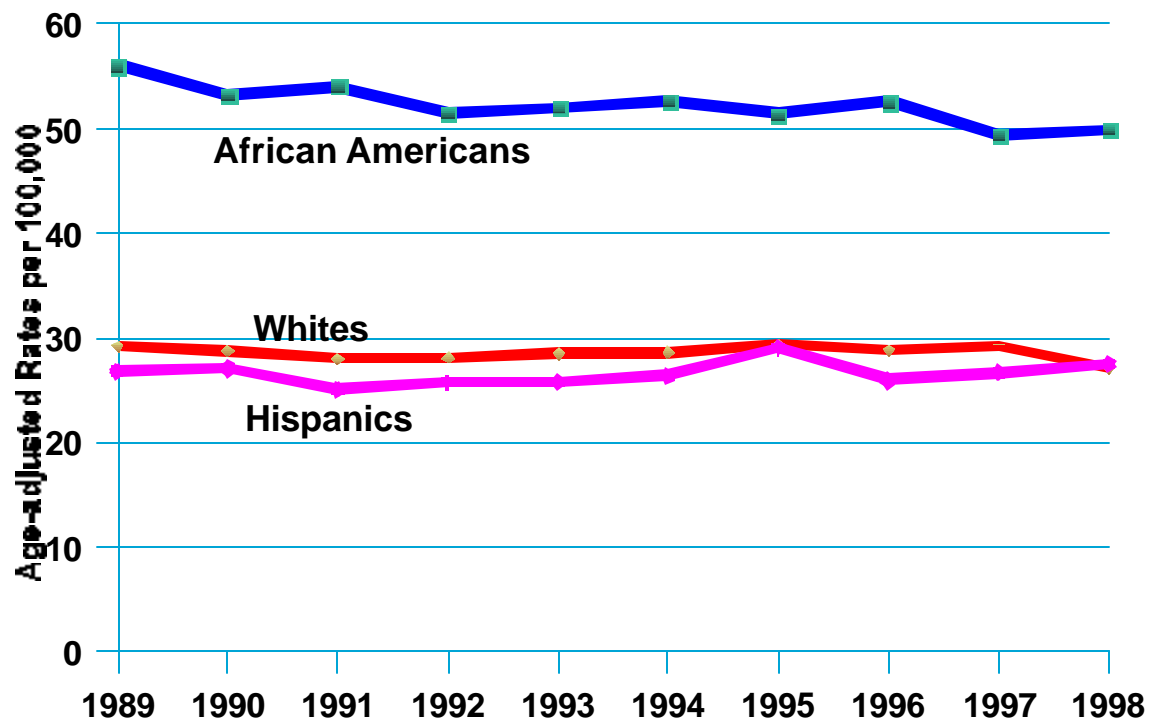
- In 1998, a total of 9,808 Texas residents (7 percent of all deaths) died of stroke for an overall mortality rate of 29.5 per 100,000 population. While the rate decreased slightly from 1997, the decline was not statistically significant.
- Risk of dying due to stroke does not differ between males and females.
- Among the race/ethnic groups, African American residents have almost twice the risk of dying from stroke when compared to Whites and Hispanics.

# MORTALITY: STROKE

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## Stroke

*Ten-Year Mortality Trends by Race, Texas 1989-1998*



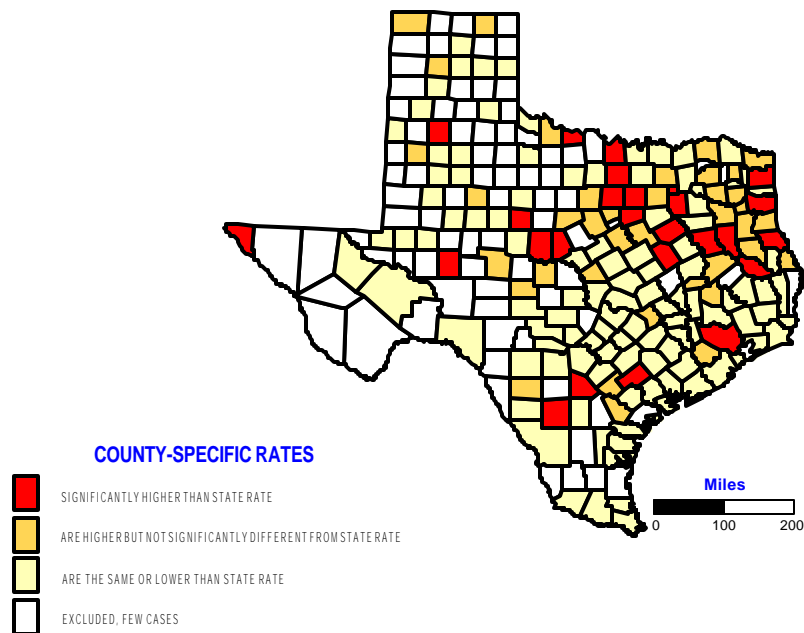
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■ African Americans experienced higher mortality rates for stroke when compared to Whites and Hispanics for each year during the period 1989 through 1998.

# MORTALITY: STROKE

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## STROKE 5-YEAR AVERAGE AGE ADJUSTED MORTALITY RATES 1994-1998



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■ Shaded areas in the map represent geographic areas in Texas that have mortality rates that are higher or lower than the state's 5-year average age-adjusted mortality rate of 30.9 deaths per 100,000 persons.

■ About 26 Texas counties have mortality rates that are statistically significantly higher than the state's 5-year average rate. These counties are shaded red in the map.

■ About 38 Texas counties have higher mortality rates but these rates were not statistically significantly different than the state's 5-year average. These counties are shaded yellow in the map.

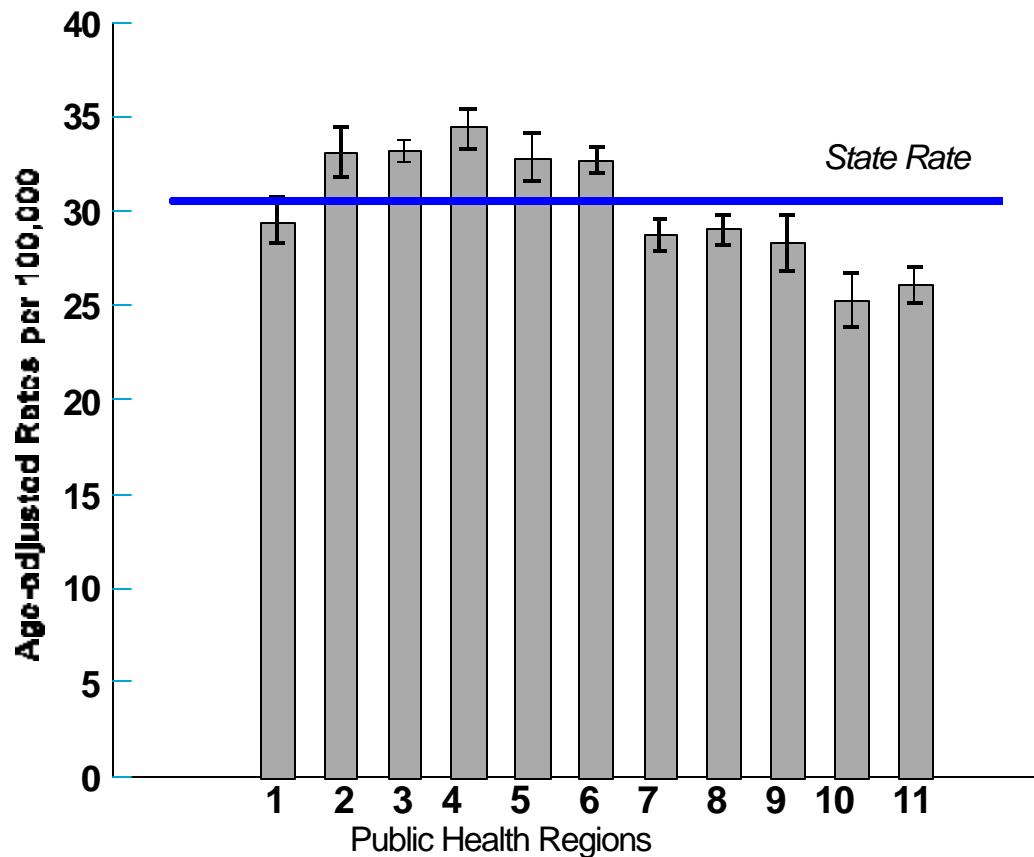
■ About 109 Texas counties have lower mortality rates than the state's 5-year average. These counties are shaded light yellow in the map.

# MORTALITY: STROKE

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## Stroke

*Texas Public Health Regions, 1993-1997*



■ The graph shows that the 5-year average age-adjusted mortality rates for stroke for five Texas public health regions were higher than the overall 5-year average age-adjusted mortality rate for the state. These regions include PHR 2, 3, 4, 5, and 6.

# **MEDICAL RISK FACTORS**

## **BEHAVIORAL RISK FACTORS**

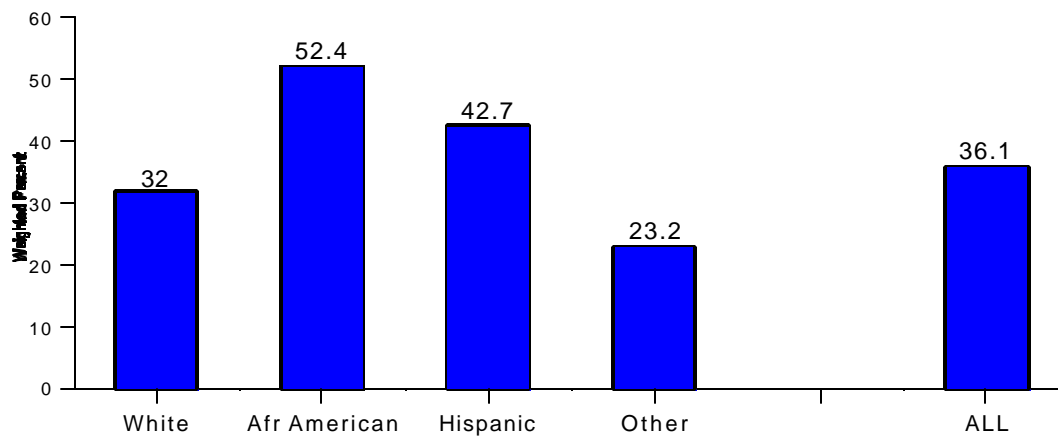
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# RISK FACTORS: OVERWEIGHT

## PREVALENCE OF OVERWEIGHT - Adults, 18 year of Age and Over

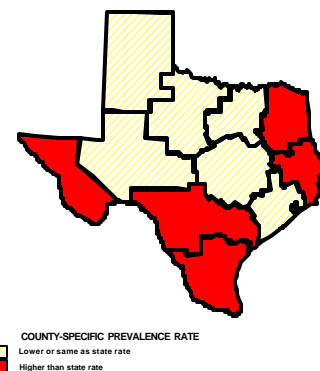
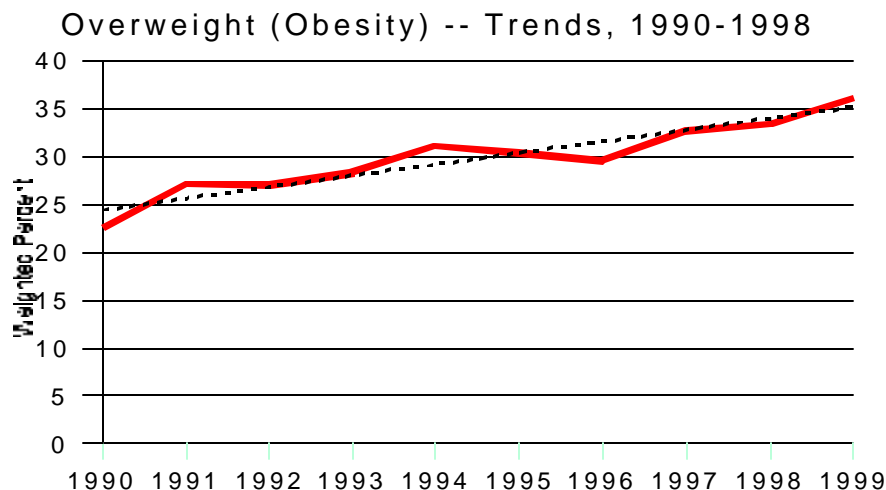
Texas - 1999



(Based on Body Mass Index)

Source: BRFSS, 1999

## PERCENT OVERWEIGHT Texas Adults, 18 years and older 1990-1995



SOURCE: TDH, BRFSS

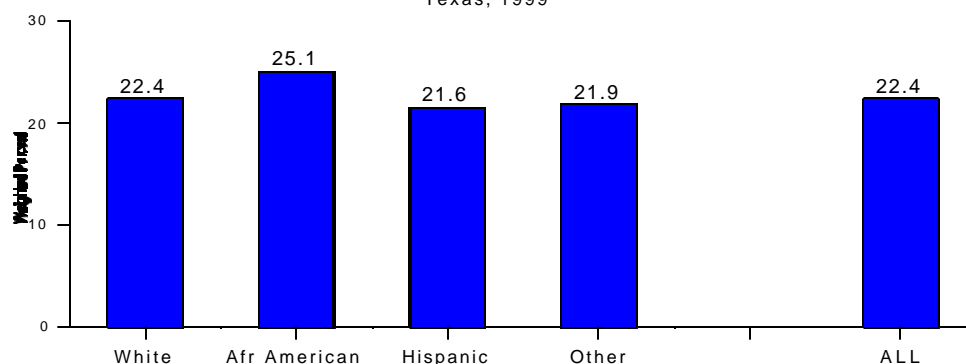
■ Recent survey data show that about 36 percent of adult Texans (age 18 and older) are classified as overweight (based on Body Mass Index, over 27.3 for women and over 27.8 for men). Data also show that prevalence trends for obesity have been gradually increasing since 1990.

■ Being overweight is associated with elevated blood cholesterol levels, elevated blood pressure, and non-insulin-dependent diabetes mellitus. It is also an independent risk factor for cardiovascular disease.

# RISK FACTORS: CURRENT SMOKING

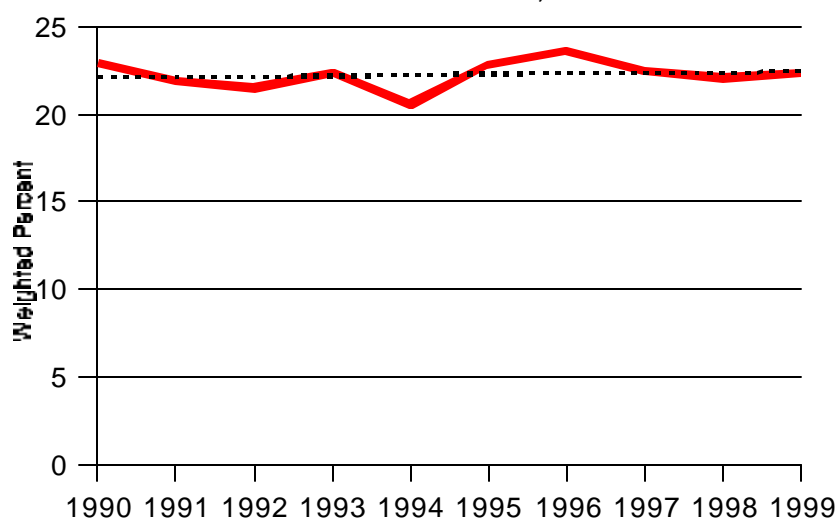
## CURRENT SMOKERS - Adults, 18 years of Age and Over

Texas, 1999



SOURCE: BRFSS, 1999

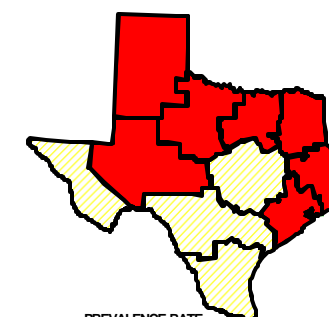
## Current Smokers -- Trends, 1990-1999



## PREVALENCE OF CURRENT SMOKING

Texas Adults, 18 years and older

1990-1995



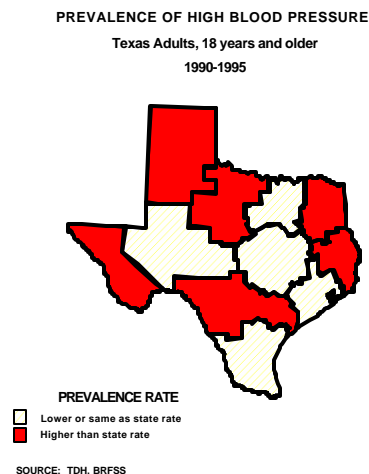
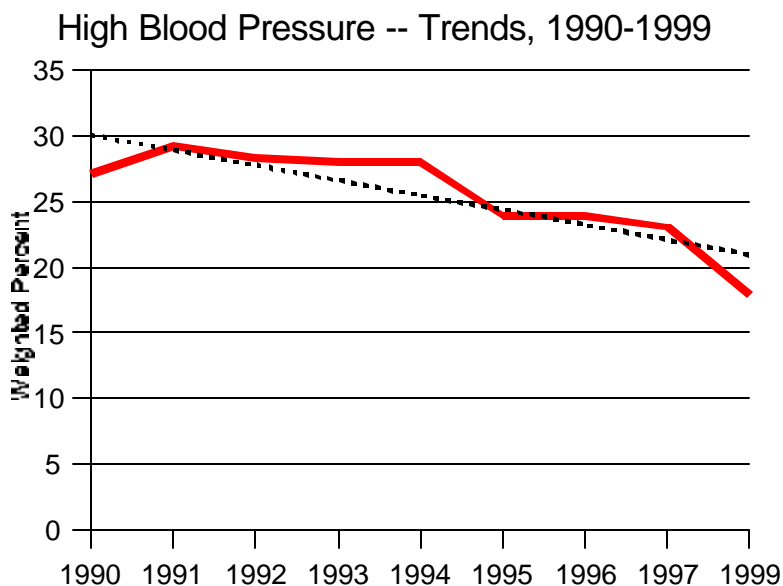
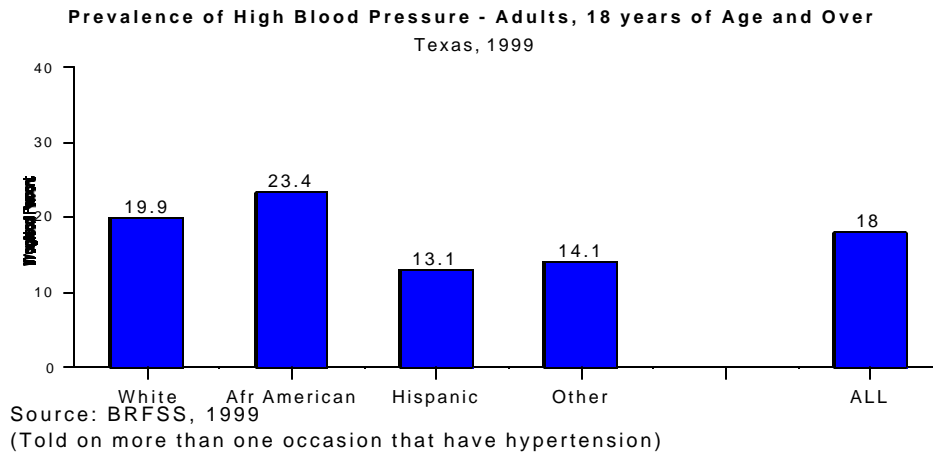
## PREVALENCE RATE

Lower or same as state rate  
Higher than state rate

SOURCE: TDH, BRFSS

Recent survey data show that about 22 percent of adult Texans (age 18 and older) classified themselves as current smokers. This observed prevalence exceeds the Healthy People 2000 target of reducing cigarette smoking to a prevalence of no more than 15 percent among people aged 18 and older. Data also show that prevalence trends for smoking have been steady since 1990.

# RISK FACTORS: HIGH BLOOD PRESSURE

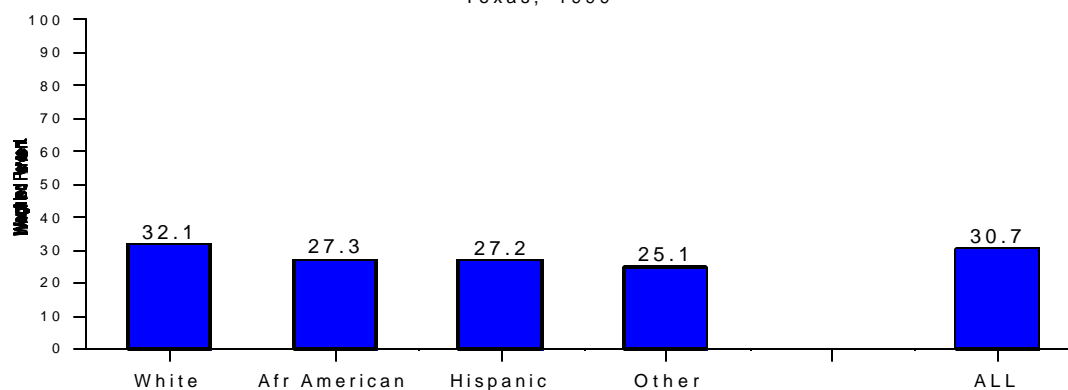


- Based on the 1999 survey, 18 percent of adult Texans (age 18 and older) reported that they have been told on more than one occasion that their blood pressure is high.
- Elevated blood pressure indicates that the heart is working harder than normal, putting both the heart and the arteries under a great strain. This may contribute to heart attacks, strokes, kidney failure, damage to the eyes and atherosclerosis.

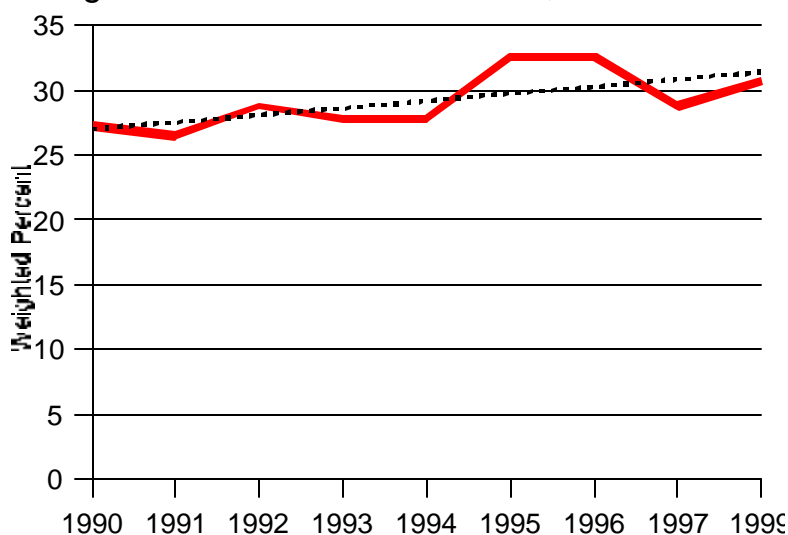


# RISK FACTORS: HIGH BLOOD CHOLESTEROL

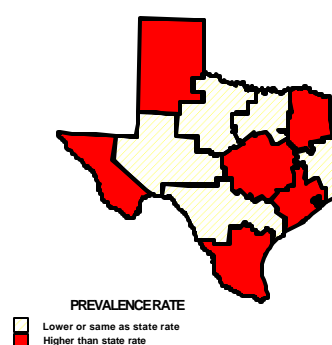
PREVALENCE OF HIGH BLOOD CHOLESTEROL - Adults, 18 years of Age and Over  
Texas, 1999



High Bld Cholesterol -- Trends, 1990-1999



PREVALENCE OF HIGH BLOOD CHOLESTEROL  
Texas Adults, 18 years and older  
1990-1995



SOURCE: TDH, BRFSS

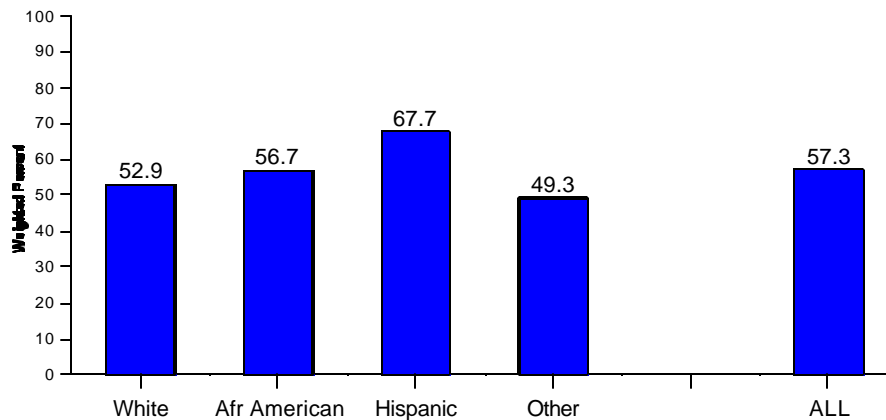
■ Recent survey results show that about 31 percent of adult Texans reported that their blood cholesterol level is higher than the desirable limit. The trend has been increasing gradually since 1990.

■ It has been accepted that a level below 200 mg/dl is the most desirable blood cholesterol level since higher levels are associated with increased risks for cardiovascular diseases.

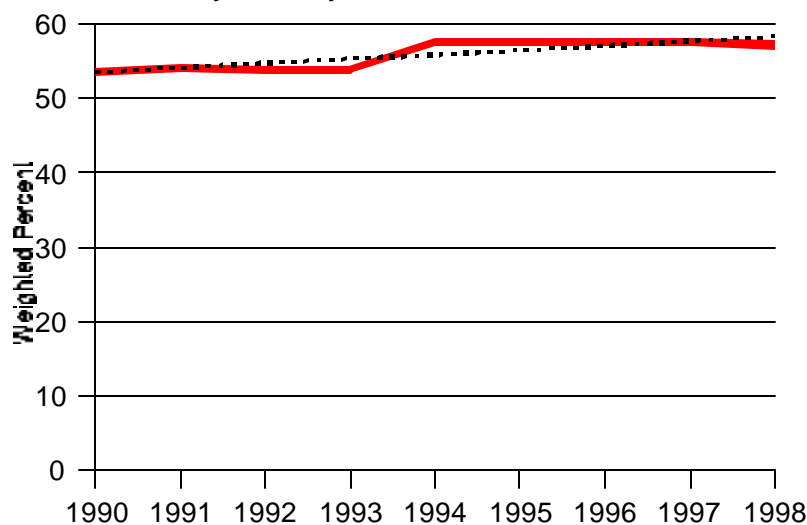
# RISK FACTORS: SEDENTARY LIFESTYLE

## SEDENTARY LIFESTYLE - Adults, 18 years of Age and Over

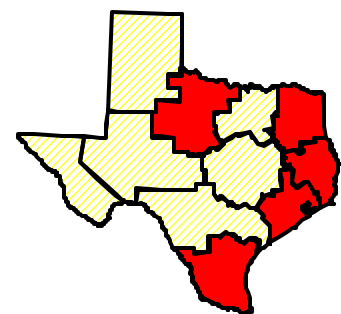
Texas, 1998



## Sedentary Lifestyle -- Trends, 1990-1998



## SEDENTARY LIFESTYLE Texas Adults, 18 years and older 1990-1995



PREVALENCE RATE  
 Lower than state rate  
 Same as or higher than state rate

SOURCE: TDH, BRFSS

- Recent survey results show that about 57 percent of adult Texans do not practice the recommended level of physical activity, and are completely sedentary (i.e., physical activity fewer than three times per week, and less than 20 minutes per session). Prevalence rates have increased gradually since 1990.
- People who are sedentary have twice the risk of heart disease as those who are physically active.
- Physical activity reduces the risk of dying of heart disease and provides protection against other chronic diseases and conditions such as high blood pressure, diabetes and colon cancer.

# TECHNICAL NOTES

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# TECHNICAL NOTES

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## ***Mortality File***

Data on mortality file were compiled and tabulated by the Statistical Services Division of the Bureau of Vital Statistics. Sex-, race-, and age-specific mortality data for Texas were computed using the Epigram software for years 1988 through 1997. All death rates are age-adjusted using the 1940 U.S. population as the standard.

## ***Cause of Death Classification***

The following ICD-9 codes are used in this report:

Total cardiovascular diseases	-	390-459
Ischemic heart diseases	-	410-414
Stroke	-	430-438

## ***Race/Ethnicity***

The categories of race/ethnicity used in this report reflect current and historical practices in the Texas Department of Health; the White, African American and Hispanic categories are mutually exclusive. Specifically, 90 percent of the Texas Hispanic population is composed mainly of Mexican Americans, compared to 65 percent of the U.S. Hispanic population. This difference should be kept in mind when making comparisons between Texas and U.S. data.

## ***Medical and Behavioral Risk Factors***

The prevalences of behavioral risk factors and use of preventive services are estimates from the Texas Behavioral Risk Factor Surveillance System (BRFSS) for Texas residents at least 18 years of age. Since 1987, the Texas Department of Health, in cooperation with Centers for Disease Control, has been conducting the BRFSS, which is a monthly telephone survey that collects health information from randomly selected adult Texans.

## ***Sub-state level data***

Unfortunately, because of sample size limitations and the large number of counties in the state (254), meaningful risk factor and preventive health behavior estimates at the county level are not possible. However, data estimates at the Public Health Region (PHR) level were calculated by aggregating data from six consecutive survey years for most variables (1990-1995) and reweighted to reflect the 1993 population distribution for each PHR.

# RESOURCES

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## **Texas Department of Health Resources**

### ***Bur of Disease, Injury and Tobacco Prevention***

1100 W. 49th Street, T-402  
Austin, Texas 78756  
512-458-7200  
512-458-7618 (Fax)

### ***Adult Health Program***

1100 W. 49th Street, G-408  
Austin, Texas 78756  
512-458-7534  
512-458-7254 (Fax)

### ***Breast and Cervical Cancer Control Prevention***

1100 W. 49th Street, G-407  
Austin, Texas 78756  
512-458-7644  
512-458-7650 (Fax)

### ***Chronic Disease Community and Worksite Wellness***

1100 W. 49th Street, T-402  
Austin, Texas 78756  
512-458-7670  
512-458-7618 (Fax)

### ***Diabetes Council/Diabetes Program***

1100 W. 49th Street, T-401  
Austin, Texas 78756  
512-458-7490  
512-458-7408 (Fax)

### ***Epidemiology/BRFSS***

1100 W. 49th Street, T-401  
Austin, Texas 78756  
512-458-7200  
512-458-7618 (Fax)

### ***Office of Tobacco Prevention and Control***

1100 W. 49th Street, T-406  
Austin, Texas 78756  
512-458-7402  
512-458-7618 (Fax)

### ***Public Health Region 1***

1109 Kemper  
Lubbock, Texas 79403  
806-744-3577  
806-741-1366 (Fax)

### ***Public Health Region 2 & 3***

P.O. Box 181869 76096-1869  
1351 E. Bardin  
Arlington, Texas 76018  
817-264-4000  
817-264-4455 (Fax)

### ***Public Health Regions 4 & 5 North***

1517 W. Front Street  
Tyler, Texas 75702  
903-595-3585  
903-593-4187 (Fax)

### ***Public Health Regions 6 & 5 South***

5425 Polk, Suite J  
Houston, Texas 77023  
713-767-3000  
713-767-3049 (Fax)

### ***Public Health Region 7***

2408 S. 37th Street  
Temple, Texas 76504-7168  
254-778-6744  
254-778-4066 (Fax)

### ***Public Health Region 8***

7430 Louis Pasteur Dr.  
San Antonio, Texas 78229  
210-949-2000  
210-949-2010 (Fax)

### ***Public Health Regions 9 & 10***

P.O. Box 9428 79995-9428  
6070 Gateway East, Suite 401 79905-9428  
El Paso, Texas 79905-9428  
915-774-6200  
915-774-6280

### ***Public Health Region 11***

601 West Sesame Drive  
Harlingen, Texas 78550  
956-423-0130  
956-444-3299